THE METAL INDUSTRY

WITH WHICH ARE INCORPORATED
THE ALUMINUM WORLD, THE BRASS FOUNDER AND FINISHER AND ELECTRO-PLATERS REVIEW
A TRADE JOURNAL RELATING TO THE NON-FERROUS METALS AND ALLOYS.

OLD SERIES VOL. 14, No. 10. | NEW YORK, OCTOBER, 1908. | NEW SERIES VOL. 6, No. 10.

THE PLANT OF THE MICHIGAN COPPER & BRASS COMPANY.

In this issue we are able to present to our readers a description of the new plant of The Michigan Copper and Brass Company, Detroit, Mich.

No better exemplification that manufacturing follows population can be afforded than by the establishment in the Middle West of this enterprise. Time was when brass and brass goods were almost exclusively made, if not in the New England States, in locations not removed far therefrom, but with the growth of that part of the country commonly called "Middle West" much brass in the form of sheets, wire, rods and tubes is now remanufactured throughout that section into a great variety of articles. For the future, therefore, the starting of these new mills cannot but be of a constantly increasing advantage to users of goods in that section calling for the company's product.

GENERAL VIEW OF ROLLING MILL.

As is well known, the demand everywhere has been taken care of by the expansion of old mills rather than by the starting of new, but with the greater volume of business augmenting year by year and reaching for a time its height in the year last passed, it was seen that there was ample room for the establishment of an additional mill to serve the increasing trade of the West. The inception of the enterprise is to be traced to this condition and the public spirit and energy of its founder.

Ground was first broken in January, 1906, and the first manufactured goods shipped in August, 1907.

Considering the period of construction, the most active this country has ever experienced, the time required for building may be regarded short. Unfortunately but a few weeks after commencing manufacture the panic of October last, with the ensuing widespread depression, was encountered. Nevertheless, the directors and management in the face of this condition, one which would have deterred a less courageous and determined body of men, decided to continue active operations, convinced that the expected period of dullness could wisely be devoted to perfecting its organization, with resulting ability to produce goods fully equal to those of longer established mills. It was argued that with experienced and competent supervision and workmen, coupled with improved equipment incident to latest installation, the end desired would surely follow. The strength of this position is hardly to be questioned as the "knowing how," learned by virtue of previous experience, can be transferred to new surroundings and immediately made effective, thereby enabling such organization to start abreast with its competitors.

Whilst the brass and copper business may yet be considered restricted, its growth, notably in recent years, has developed a greater number of men with managerial abil-

ity, thereby making it easier for those desirous of engaging in the business to secure services of men of higher order well nigh formerly impossible with the business concentrated in the hands of a few producing a limited output.

LOCATION.

The plant is situated on the Detroit River extending

VIEW OF HOT ROLLS.

therefrom to Jefferson avenue, West, and covers 13 acres. During the navigation season all copper mined in Michigan and shipped East passes the rear of the company's property, permitting of supply being received direct from steamboat to company's own dock. During the winter months raw materials and supplies are received over the company's siding, an extension of the M. C. Railroad, as shown in sketch.

DESCRIPTION OF MILL.

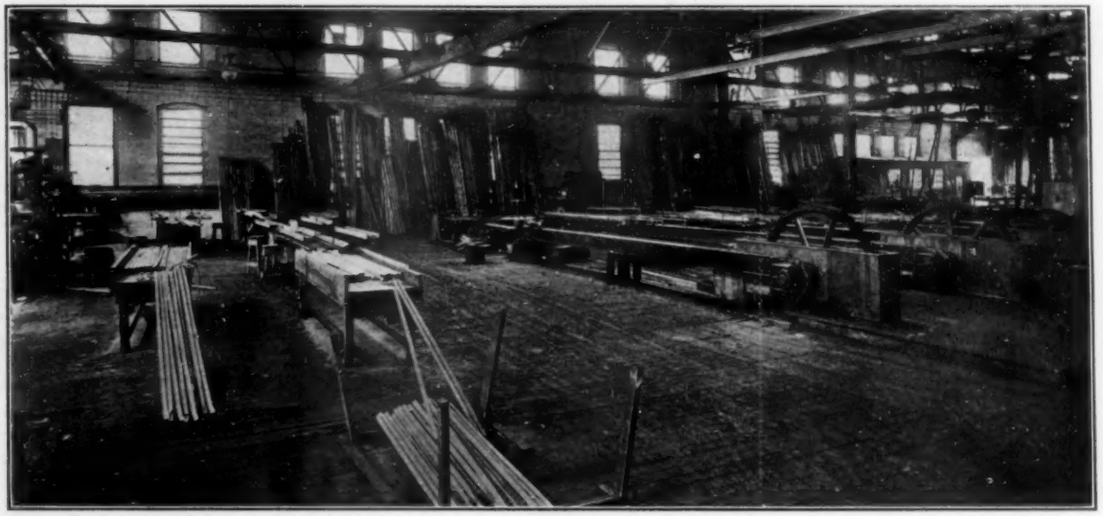
It is only in the last decade that the brass rolling business has amounted in volume sufficient to spur manufacturers to install labor saving devices and appliances; moreover, the process of manufacture, unlike the iron and steel business for example, has undergone since its inception in America no radical change, the development being confined to improvements only.

The Michigan Copper & Brass Company in installing their equipment made use of the knowledge others had gained in their extensive experience in these particulars, accompanying the main installation by such accessories as electric cranes, pneumatic hoists, improved blocking machines for coiling the metal as delivered from the rolls, latest type of furnaces and muffles, fast turning rolls, automatic stokers to boilers; in fact, every appliance known in the business, making their mill up-to-date in every respect. Among the older mills it is only the more progressive that have yet brought into play these conditions calculated to save labor and facilitate production. The importance of these is not to be underestimated when it

WIRE ROD MILL.

is remembered that but three-quarters of a cent per pound margin represents the difference between dividends and no dividends; therefore, a saving of a fraction of a cent per pound means much.

The company decided to install nothing but the best, after rigid tests applied by their engineers who kept ever before them solidity and permanency.



BRAZED TUBE MILL.

THE BUILDING.

The building is of brick and steel measuring 587 feet long and 186 feet wide and contains the entire equipment of brass and copper rolling, wire and tube mills, permitting of easy supervision, and was so planned that extensions can be readily added, the engine and boiler capacity being ample to permit of this.

The company is permitted to extend their land by filling in to the harbor line, thereby materially adding to its acreage.

The water supply, an adequate amount of which is so essential, is obtained from the Detroit river by means of a 24-inch cast iron pipe extending into the stream underneath the dock to the harbor line as shown in engraving of the exterior of the mill.

The power is mainly furnished by an Allis-Chalmers cross-compound upright engine direct connected to a 12-inch shaft, steam being supplied from Wickes boilers, fed by Murphy automatic stokers. The hot rolls are the product of the A. Garrison Foundry Company, Pittsburgh, and the cold rolls of the Farrel Foundry & Machine Company, Ansonia, Conn., the Waterbury-Farrel Foundry & Machine Company, Waterbury, Conn., furnishing the rod rolls. The Morgan Construction Company, of Worcester, Mass., turned out the wire machinery, and the Richards Manufacturing Company, Bloomburg, Pa., the draw benches. The Torrington Manufacturing Company, Torrington, Conn., the E. J. Manville Machine Company, Waterbury, Conn., and the Waterbury Machine Company, Waterbury, Conn., were concerned in the furnishing of slitters, smaller wire drawing machines, straightening machines, etc., etc. Annealing furnaces were designed and installed by the Rockwell Engineering Company, of New York.

ANNEALING FURNACES.

The raw material enters the rear of the plant from the river side and steadily progresses in process of manufacture to the Jefferson avenue end of the building where are located shipping rooms equipped with cranes and hoists for shipment by carload and dray.

OFFICERS OF THE COMPANY.

The officers of the company are George H. Barbour, president; James E. Danaher, vice-president; D. M. Ireland, second vice-president; John R. Owen, secretary; George H. Barbour, Jr., treasurer. Directors: George H. Barbour, D. M. Ireland, Jas. E. Danaher, H. B. Ledyard, Jas. T. Whitehead, E. J. Corbett, Jeremiah Dwyer, F. M. Alger, F. T. Moran.

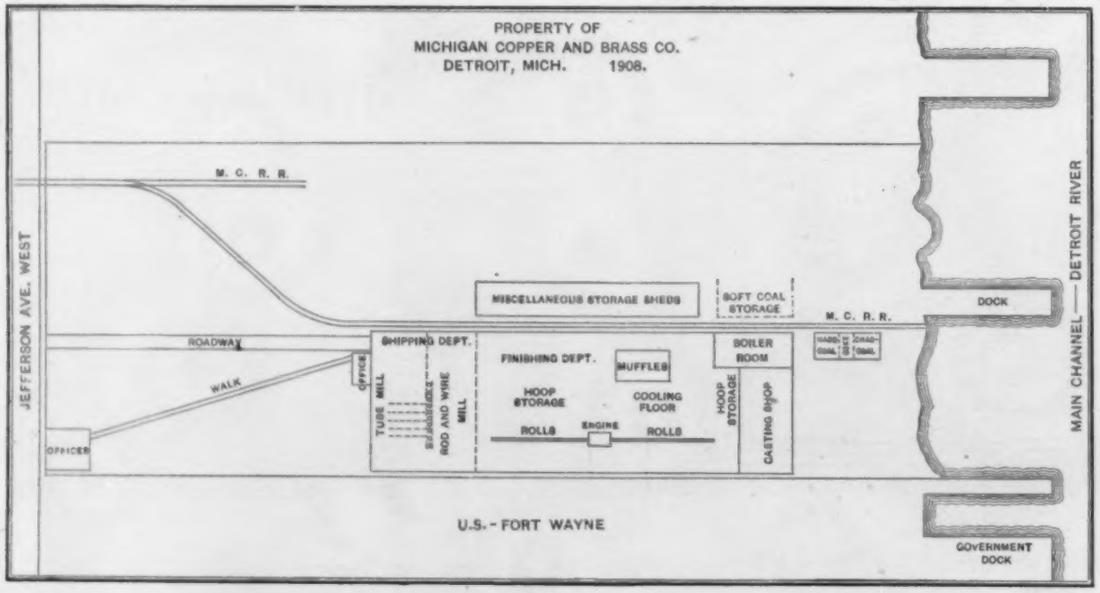
GEORGE H. BARBOUR, FOUNDER AND PRESIDENT.

In addition to this office Mr. Barbour occupies that of vice-president and general manager of the Michigan Stove Company, manufacturers of the celebrated Garland stoves and ranges. As alluded to earlier in this article, the establishment of these mills is due to his energy, constructive ability and desire to aid in the growth of Detroit as a manufacturing center. The correctness of his conclusion that there was sufficient scope for the enterprise has been demonstrated by the amount of business which in a year of extreme depression has already reached this company.

JEREMIAH HOWE.

In length of time Mr. Howe's connection with the business easily antedates any of the others connected with the enterprise. Mr. Howe first entered the employ of the Coe Brass Manufacturing Company, Torrington, Conn., in 1871, remaining there in various capacities until 1881, when he came to Detroit as shipping clerk for the Detroit Copper & Brass Rolling Mills. By close application and fidelity to his employer's interests he rose to position of superintendent. Mr. Howe witnessed the expansion of these mills from a very small nucleus. Soon after leaving their employ he occupied himself in organizing the present Michigan Copper & Brass Company, aiding Mr. Barbour in that work. During the period of

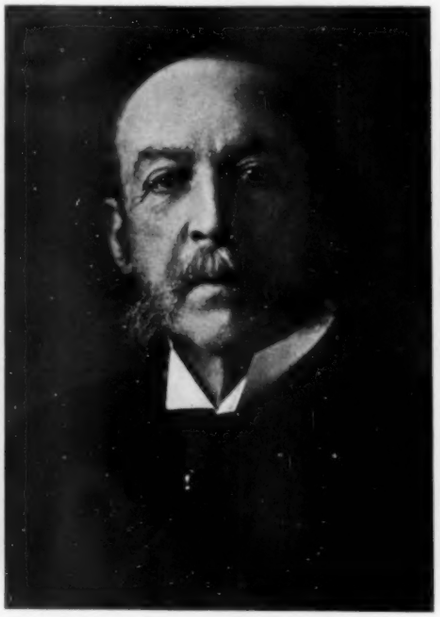
CASTING SHOPS, METAL HOUSE.



PLAN.

construction Mr. Howe was actively employed as superintendent and general adviser. To his judgment was left the class of goods to be manufactured, size of mill, etc., etc., with result that the mills were equipped to make brass and copper in every variety of sheets, wire, rods and tubes, with the exception of seamless tubing, the intention being to take this up later. Unfortunately soon after manufacturing was commenced in August, 1907, Mr. Howe was obliged to forego his duties because of sickness.

J. R. OWEN, Secretary.



GEORGE H. BARBOUR, President.

GEO. H. BARBOUR, JR., Treasurer.

JOHN R. OWEN, SECRETARY.

Mr. Owen entered the employ of Randolph & Clowes, Waterbury, Conn., operating brass and copper rolling mills, in 1895 in the capacity of purchasing agent, continuing with them for three years. He then started with the Coe Brass Manufacturing Company, Torrington and Ansonia, Conn., in the commercial department of that company, resigning in 1908 to become secretary to the Michigan Copper & Brass Company.

GEORGE H BARBOUR, JR., TREASURER.

Mr. Barbour's entrance into the brass and copper business dates from the inception of the enterprise, he being actively employed during the construction of mills. Soon after manufacturing was commenced Mr. Barbour was made treasurer.

JEREMIAH HOWE, First Superintendent.

JOHN TYLER, Superintendent.

H. A. HIGGINS, Master Mechanic.

D. A. BURNHAM, GENERAL ACCOUNTANT.

Mr. Burnham's connection with the brass business dates from 1902, in which year he entered the employ of the Coe Brass Manufacturing Company, Ansonia, Conn., filling various office positions until in 1907, when he re-

signed to accept the position of general accountant with the Michigan Copper & Brass Company.

E. S. COLVIN, ORDER CLERK.

Mr. Colvin started as invoice clerk with the Chicago Brass Company, Kenosha, Wis., in 1904, and was promoted to order clerk, resigning his position in November of 1907. In January last he started with the Michigan Copper & Brass Company in charge of the order department.

C. E. SANBORN, Traveling Salesman.

D. A. BURNHAM, General Accountant.

F. B. CLARK, Traveling Salesman.

JOHN TYLER, SUPERINTENDENT.

Mr. Tyler was formerly superintendent of the Chicago Brass Company, Kenosha, Wis., and prior thereto was in the employ of the Coe Brass Manufacturing Company, Torrington and Ansonia, Conn. He assisted prominently in the development of the latter mentioned mills for several years succeeding their purchase from trustees of Wallace & Sons, after which he was transferred by the Coe Management to Kenosha, there to become superintendent of their interests at that place. Shortly after resigning to accept the position of superintendent with the Michigan Copper & Brass Company. His connection with the brass industry dates from 1886.

H. A. HIGGINS, MASTER MECHANIC.

Mr. Higgins first became connected with the brass business in the capacity of draftsman and designer with the Coe Brass Manufacturing Company, Torrington and Ansonia, Conn. Later he entered the employ of the Chicago Brass Company, Kenosha, Wis., in the mechanical department, resigning at the same time as Mr. Tyler. Mr. Higgins began in the business in 1900.

C. E. SANBORN, SALESMAN.

Mr. Sanborn's connection with the brass business extends back to 1881, in which year he entered the employ of the Detroit Copper & Brass Rolling Mills, Detroit, first taking up office work, after which he was made traveling salesman, continuing in that capicity for many years. Probably no salesman in the brass business enjoys a wider acquaintance in the Middle West than Mr.

E. C. COLVIN, Order Clerk.

A. C. DALLAS, Western Representative.

C. D. DALLAS, Western Representative.

Sanborn. Not long after severing his connection with his former employers he accepted position as traveling salesman with the Michigan Copper & Brass Company.

F. B. CLARK, SALESMAN.

The Bridgeport Brass Company, Bridgeport, Conn., first employed Mr. Clark in the business, he going with them in 1900 in capacity of traveling salesman, covering the Middle West. Shortly after leaving the employ of that conmpany he became indentified in the same capacity with the Michigan Copper & Brass Company.

A. C. DALLAS & SON, INC., WESTERN REPRESENTATIVES.

A. C. Dallas first became identified with the brass and copper industry in the capacity of salesman for Benedict & Burnham Manufacturing Company, Waterbury, Conn., about 1895, and continued in that capacity for several years. After the above corporation became a part of the American Brass Company, the Benedict & Burnham Brass & Copper Company, an Illinois corporation, was formed to operate a store in Chicago and to take care of Western business, Mr. Dallas having charge of the same and being secretary and treasurer. After operating this store for five years, the business was absorbed by the Chicago Brass Company, owned by the American Brass Company, and the store in Chicago closed; Mr. Dallas being at that time secretary of the Chicago Brass Company. On severing his relations with the latter, he incorporated the firm of A. C. Dallas & Son, handling brass and copper goods, and representing the Michigan Copper & Brass Company, as sales agent in the West.

C. D. DALLAS.

After entering the employ of the Benedict & Burnham Brass & Copper Company soon became salesman. On the dissolution of that company, he entered the employ of the Chicago Brass Company as their traveling representative in the Middle Western States, continuing in that capacity for several years, finally resigning his position to associate himself with his father in the firm of A. C. Dallas & Son, Inc.

ALLOYS.

By Jos. H. Hart.

To the average operating foundryman the production of alloys is apparently largely a question of chance. Each foundryman has different conceptions in regard to different alloys used for different purposes in the industrial world and often the production of a special alloy, involving special physical properties for its utilization in some industrial development is regarded as an important business secret and valued as such. Each one treasures certain theories in regard to the development of alloys in their combination or treatment for specific results and each believes thoroughly in the chance discovery of some alloy possessing remarkable properties suitable for special physical requirements. However, the study of alloys to-day is becoming an exact science. The field is an enormous one and comparatively little has been done, but the effects of certain ingredients in any proportion is known thoroughly and need not be attempted by any individual from an experimental view-point.

The chief difficulty, or rather, the reason for the unsettled state in alloy practice in scientific development to-day, is due to the fact that new metals, from a chemical view-point, are constantly becoming practically available. The development of the electric furnace and many chemical reactions, such as the use of thermite in the production of chromium and many of the rare metals, have led to the possibility of their production in large quantities and their effect in the field of alloys is unknown, although knowledge is being added steadily to this branch of engineering along scientific lines. Thus calcium has recently been isolated in chemical development by means thoroughly practicable and permitting of its utilization in large quantities in alloys if desired. The same can be said of a number of metals and the fact that there exist a large number of different metals, much greater than formerly existed, and that these are capable of combination in any proportion, or proportions, and under various conditions of mixing, has led to the multiplicity of factors in this field and the apparent inadequacy of scientific development to classify the data and present certain fixed and definite rules in regard to alloy production.

However, certain definite conditions are now recognized in alloy production and the field has become simplified from a theoretical point of view, although much complicated from a practical view-point. Thus the mixing of metals is a purely physical process. Mixed in a certain proportion they act as any other chemical re-agents. Chemical reactions exist and are of great importance in determining the physical character of the alloy, although the reactions are of minor significance from a chemical view-point, since the forces of combination are slight. Again the theory of solution and crystalization enter in their development, aggravated by the necessity of investigation under abnormally high temperatures, and this complexity of crystaline action, solubility and chemical reaction, under these abnormal temperature conditions, presents a field for research which is practically at its inception, although the lines of investigation are well set down. The further fact that almost any chemical element can be used in alloys and presents capabilities for solution and crystalization and chemical reaction, with resulting effect on the character of the alloy, still further complicates the matter and removes the department largely from the isolated position of alloy construction and production and makes it merely a phase of the greater science of chemistry, limited in its accessibility for research by temperature conditions.

Thus metals heated to the fusing point behave precisely as other liquids. Various salts dissolved in water or some other liquid possess heats of solubility and often undergo chemical reactions as well, by which they are much altered. Thus salt dissolved in water can exist in various amounts of solubility, producing salt solutions of different strength and different physical properties. On cooling the salt often crystalizes out in various amounts and on still further cooling the liquid itself may be solidified, the character of the solid as such depending upon the amount of salt or salts present, their possibility of chemical reaction and the rate at which freezing has gone on.

All of these reactions and conditions can be investigated by the aid of a comparatively small number of instruments. Chief among these in ordinary work is the calorimeter. Heat is evolved in different amounts on cooling or absorbed on heating at different temperatures due to various reactions and changes in the chemical reactions. Thus in heating a mixture of salt and water which has been frozen, the water gradually melts, and at certain stages dissolves certain quantities of the salt, which amounts are variable with temperature and dependent upon the form in which the salt has been frozen out. Thus many of the salts crystalize in connection with

water molecules, known as the water of crystalization, at different temperatures and the solubility and melting of these different crystals is different at different temperatures. Thus at one time we have an approximate solid made up of a strong solution with solid crystals of some other chemical combination of the salt with water. The fluidity, and what would be in the alloy the ductility and tensile strength, vary not only with the quantity and character of these two ingredients but with the shape and tensile strength of both the crystaline structure and the enclosing material.

Alloys to-day are regarded as solid solutions of metals in many respects. Solution is going on in solids, though at a much slower rate than in liquids, and the motions of the parts is often as pronounced, after long-time intervals, in metallic alloys as they are in ordinary chemical solutions in short intervals of time.

The structure of an alloy is investigated under different conditions of chemistry and heat treatment by means of the microscope along lines developed by the micro-metallurgist. By the determination of a simple cooling curve or the plotting of the variation of temperature with time of the cooling alloy, many of the complex reactions going on in its interior are at once apparent, if most of the physical and chemical properties of the ingredients are known. Heats of solution and crystalization and chemical reaction become at once apparent by a study of this curve, due to its variation from the normal radiation curve for a simple element. Evolution of heat, by abnormally high chemical reaction or solution and its absorption by the reverse actions are at once apparent in changes in slope in this curve and its amount can be readily determined by means of the calorimeter.

A further study of the metal under these conditions, by means of micro-photographs obtained from etching the metal, show at once the physical structure and verify the theoretical determinations of the reactions. Thus the cooling curve of iron or steel is a remarkably complicated line and shows truthfully, when understood, all the various reactions and combinations and relative productions of martensite, perlite, ferite, carbon in solution and combined, etc., making the problem a comparatively complicated one for this alloy. However, its development in this line and its practical utilization have given marked results and even though at its inception here it prophesies capabilities in all other lines of development in alloy construction as well.

The physical properties of alloys and metals in combination are so variable and pronounced that, as has been said, the work has but commenced. The production of Heusler's alloy, with its remarkable magnetic properties, presents wonderful possibilities in the production of other types possessing this property. Iron is the sole material to-day possessing magnetic permeability of sufficient character for its use in electrical commercial development. The question of permanent magnetism and the magnetic permeability of various alloys and the causes of this variation are practically unknown. Heusler's alloy, from its magnetic permeability view-point, is as largely a mystery to-day as at its conception. Every alloy produced should have its magnetic possibilities at once tested and recorded.

The magnetism of some metals is so variable and dependent upon heat conditions that its investigation in other alloys is eminently desirable. Thus some alloys, such as nickel steel, are strongly magnetic under some conditions and practically non-magnetic under others, depending upon the treatment in the production of the alloys themselves. If heated to a fairly high temperature and cooled to normal temperatures they are absolutely non-magnetic. If then cooled to the temperature of liquid air, and in some cases only a few degrees below normal, they become strongly magnetic and remain so under normal conditions, their magnetic properties thus being dependent upon their previous heat history. Other properties of alloys are equally dependent upon preceding heat histories, such as tensile strength, breaking strength, ductility, malleability, etc.

QUALITY VS. QUANTITY.*

By J. N. Gamble, Kewanee, Ill.

Is there antagonism between the two? Can we not improve the quality of our product and at the same time secure the maximum output of our various brass foundries?

In the beginning of this article, let me say that it is my intention to strive to show you that the improvement in quality and increase in quantity must go hand in hand to insure our greatest success. To me, it seems the question is too often asked, "How many heats did you get to-day?", instead of, "How many pounds of good castings did you make?" Your output is not governed by the amount melted, but by the amount of good castings produced. To illustrate, here are two foundries making the same class of goods; look at their production sheets—the one shows 40,000 lbs. melted with production of 20,000 lbs. good castings; the other 35,000 lbs. melted with a production of 20,500 lbs. good castings; and I venture to say if you could examine the castings you would find a marked difference in the appearance of the castings from these two foundries.

When, as a boy, I was learning how to work, my father said to me, "My boy, remember that no job is well done because you take ten hours to do what ought to have been done in five." It is certainly just as true that a foundry running 25% less than its capacity may be making the poorest possible castings, while the one running to its utmost may be making the best. But the question is, "HOW?"

First—Men.
Second—Metal mixtures.
Third—Machinery.
Fourth—Molds.
Fifth—Cores.

Some time ago, I heard this statement made—that all a foundry needs as molders and machine operators is men with strong backs and weak minds. If any of you have this idea you had better throw it into the scrap pile along with the poor castings such practice will produce. There never was a time when we needed more intelligent workmen than we do at present. All factories are looking for successful managers, but many overlook the man with the overalls.

While much has been accomplished by installing machinery to do many kinds of work, it is still a fact that without intelligent and sober workmen, first-class work cannot be done with the best possible machinery; while on the other hand, it is wonderful to see the good work that can be produced with poor equipment by intelligent and sober men. In fact, the question of brains extends even down to the man shoveling sand. You will all remember the story told of the great painter who, when

*Paper read at the Toronto Convention, June, 1908, of the American Brass Founders' Association.

asked how he mixed his colors, replied, "With brains, sir," and this is what is needed in our brass foundries; for if your core sand is not properly mixed, the whole casting will be *scrap;* if your molding sand is not properly tempered the result is, *scrap;* if molds are carelessly made again, the result is, *scrap;* if your metals are not mixed in the right proportions for the particular work you are making and brought up to the proper temperature, once more you will have *scrap,* and the scrap pile is the loss account. Therefore, if these statements are correct, you will readily see the question of brains is an important one in the selection of men for a brass foundry.

Let us look at some of the qualities needed in our employees—first, the "Foreman" (some of them are here) must be a man of such character that he will have the respect of his men and must also have a thorough knowledge of brass foundry practice from core making through to finished casting. Further, he must see all things going on at all times and have perfect control of the foundry. Now let us look at some of the workmen—here is a boy setting cores; watch him, for he is some day to be a molder or machine operator; is he quick and accurate, or slow and careless? If he has the first qualities, keep him and teach him from day to day how to work and you will receive large returns in both quality and quantity of castings. If he has the second qualities and you cannot get him interested enough in his work to change his ways, drop him or your scrap pile will increase, your quality deteriorate, and your quantity diminish. You see, it takes intelligent use of a boy's brains to properly set cores in a mold. Notice this machine operator—he is putting up a large number of molds, but if you examine them, you will find the mold broken in the sharp corners; examine his pattern and you will find it has not been brushed off for some time, so while his output in flasks is large, the actual production of good castings is small. But here is an operator working next him who is putting up as many molds and they are all clean and corners perfect. Take the castings from this man's floor and you will find the output of good castings much more than the others, and the general appearance much better. Now what makes the difference, only this—the one has made use of his brains; the other is not enough interested to use what brains he may have. What is true of machine work is just as true of floor or snap bench work. It is the intelligent use of brains that counts for or against the successful operation of a brass foundry.

Now your molds are closed and you can watch the pouring. Here comes the crucible and you notice after they have poured a few molds that the metal is cold and stringy, but they pour it all into molds. Result, "Cold Shut," "Mis-Runs," and "Unsound Castings," more added to the scrap pile. This shows that the melter is not making an intelligent study of his work, and if this man is in your foundry, you had best drop him and secure a man who will make an intelligent use of his brains.

Before leaving this question, let me say that we must give our employees careful instruction in their duties if we expect them to give us the best work. They should also be shown the result of careless work. A good plan is to post a list of scrap made with name of operator making same. This has been tried with good results.

After securing men with brains in all departments of your foundry work comes the important question of metal mixtures. It is not my purpose to give you formulas for metal mixtures, as each different class of work calls for its own peculiar percentage of the various metals to give to it the peculiar qualities needed.

One thing, however, is sure; you cannot put poor metals into crucible or furnace and expect to produce a high grade of castings, and it is just as sure that you can put in good metals and make scrap. To my mind everything that goes into the mixture should be as free from dirt and all foreign substance as possible. The use of gates and sprues without cleaning is bad practice. In fact, the importance of proper mixture of metals cannot be too strongly emphasized, for if your metals are properly mixed and melted, a large part of your troubles are over. As your castings will run smooth and test tight if metals are not properly mixed and melted you may have the best of molds, pattern properly made, cores the very best and gating of pattern properly done. Still your scrap pile will grow. You may even have castings good in appearance, but they will not test tight. Shall we use crucibles or melt in open furnace? I have seen poor melting in crucibles and good in open furnace; and then again good in crucibles and poor in open furnace. A good deal depends on the proper handling of either. One thing is sure, we should protect the metal all we can from oxidation while melting to obtain castings free from defects. I believe every brass foundry should have an analysis of its castings each day to determine whether the mixture is correct. They should also have test bars for determining the tensile strength as only by this means will we know for a certainty that our product is up to standard.

Now, as to machinery, some say that you cannot make good castings on power molding machines; others contend that all castings can be made better on machines than by hand. Now, I agree with neither, but believe that we should use power machines where they are an advantage; but these machines must be as simple as possible, free from complicated bearings, as nothing destroys bearings like the fine dust and sand in our foundries. Let me say here that wonderful improvements have been made in molding machines in recent years until none of us are now prepared to say you cannot make this or that on a machine. I myself have seen fully as good castings made by machinery as by hand and have also seen some of the poorest castings made in the same way. This leads me to say that if you have a large amount of duplicate castings to make, look into the power machine, buy the best machine for your men to use. If, on the other hand, you are doing a jobbing business and have a few pieces to make from each pattern, you will need to investigate very carefully before installing the power machine. The power machine is a great quantity producer, and I believe if properly made and operated by intelligent men will produce castings that will satisfy your most particular trade.

What has molds to do with this question. Let us look at a mold—first, what is a mold? It is a quantity of sand rammed into a flask around a pattern so as to leave a perfect imprint of pattern and is a very vital part of the foundry work. The essentials of a good mold are a sand that is fine enough to take on all the peculiar sharp lines of brass patterns and open enough to allow the gases to escape freely when the metal is poured into it. Sand must be properly mixed and tempered, for if your sand is too wet you will have a "blow," then the sand must be properly rammed into flask; for if it is too hard in spots, you will have a "blow"; if too soft, metal will cut. In fact, from the wheeling of sand into shop to the placing of a perfect mold on the floor, the work must be done by intelligent men if you wish to have an output "good as to quality," and "high as to quantity."

Now, as to cores, some foundrymen seem to think they can take several kinds of sand and a little rosin or some of the various compounds, mix them together and get good results. It seems to me that to improve our quality and increase the quantity of our product, it is necessary to

have first-class cores, for a poor core is nearly certain to give you a scrap casting, or one very rough in appearance. What we should do is to secure by careful tests that core mixture which gives the best results for our particular line; and let me say, cores that are first-class for some grades of castings will not answer at all for others. Use brains in the mixture for your cores and you will have cores that will give you castings which will be a credit to your foundry.

You will note that nothing has been said in this paper regarding the pattern. Well, you ask the pattern maker and he will say that the patterns are always made right, but are they? Is it not a fact that the foundry foremen often has to try and make good castings from a pattern not properly drafted or else constructed so as to make it very difficult to make a good clean casting. It seems to me both the pattern maker and draftsman should consult the foundry foreman as he is in position to give some valuable hints as to draft, gating, etc., to obtain the best results.

In fact, with the tendency to higher steam pressure and faster speeds of all machinery, it needs the careful study of trained men if we expect to improve the quality of our goods and at the same time keep up the output to the maximum.

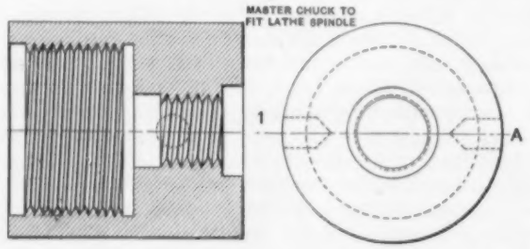
THE TURRET LATHE AND ITS EQUIPMENT.

By Easy Way.

(Continued from August Issue.)

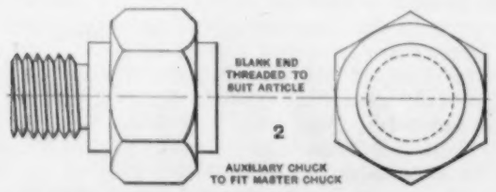
The writer will now endeavor to explain different tools for manufacturing in an easy way.

The first thing to be considered is equipping the machines with suitable chucks for holding the parts to be machined while being operated on. For small and medium work round body two-jawed chucks with slip-jaws bored or shaped to fit round or irregular articles of manufacture that can not be held by the spring collets, are used for the first operation. The guide in the jaws of the chucks



must be uniform to insure interchangeability of the slip jaws, of which there will be a large quantity if a wide range of work is being produced. A good method for making these jaws is to have a length of machine steel shaped to a gauge; it then can be cut to standard lengths. Where irregular shapes, hard to produce, have to be held, cast iron jaws can be used to good advantage. For the larger work box body two-jawed chucks should be provided. There should also be three different size revolving chucks for holding work that can be machined on more than one end or face without removing from the chuck.

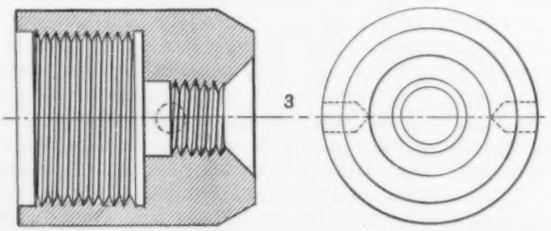
The following drawings show several styles in auxiliary chucks that have proved very useful. In making these ample provisions should be made for removing the chuck from the machine without the aid of a hammer,



and drift hexagon cold rolled stock can be used to good advantage for most chucks. For the large chucks spanner wrenches should be used, suitable holes drilled or slots milled to remove them as shown in sketch.

Drawings No. 1 and No. 3 are the master chucks and should be made in a good substantial manner and fitted accurately to the spindle nose of the machine. It is good policy to make one of the chucks for each machine and give it the machine number, as better results follow this method. Care must be exercised that the thread and aligning hole or taper for the auxiliary chucks are absolutely true and made to male gauges provided for that purpose; this must be rigidly adhered to.

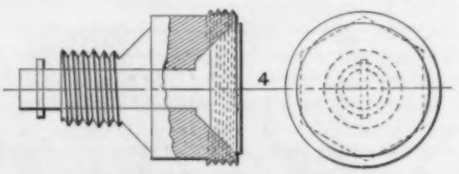
Avoid trouble with master chucks later. A great variety of auxiliary chucks can be used with the master chucks to hold articles where one operation has been performed; they should be fitted accurately to a female



gauge provided for the purpose so they will interchange with any master chuck. A great saving is affected by this arrangement as you are not tied down to any particular machine if it has a standard master chuck suitiable for the work to be produced.

Auxiliary chucks as per drawing No. 2 can be made in quantities and left blank on the nose and stored for readiness to be threaded to any required size within their limit at short notice. A master chuck is kept in the toolroom for that purpose; this method brings the cost of these useful chucks down to a minimum.

Chuck No. 4 is used for threading outside diameters or forming the same. It has a plunger for the release of the article after it has been operated on. The method of using this is to bring the lever that actuates the plunger in the machine spindle so that the actual strain of the operation is taken by the plunger, the taper part of

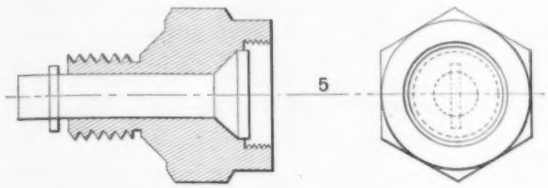


which just beds lightly for alignment; when the lever is released the strain is removed and the article can be removed by hand without stopping the machine.

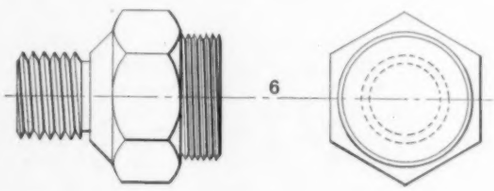
Auxiliary chuck No. 5 is for chuck male ends of parts to be operated upon and is worked in the same manner as No. 4. A common style of auxiliary nose chuck is shown in No. 6; this has no plunger. It is used on work

that has projections on its outside diameter that can be used for removing it from the chuck by means of a knock of tool in the cross slide or some other suitable device.

Chuck No. 7 goes directly upon the spindle nose and is used for heavy forming, etc. It can be made in styles

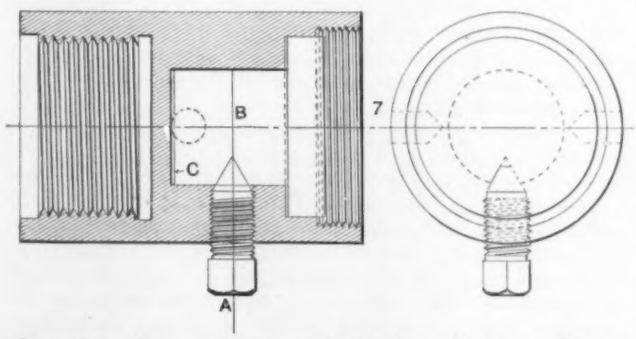


to accommodate either male or female parts. The set screw "A" is first tightened, which, by reason of the taper point, brings the plunger to a set position; the article is then put in the chuck until it rests against the plunger "B," which takes the strain of the operation; then by



loosening the set screw the plunger is allowed to slide back through space "C" thus releasing the article.

A few of the articles that can be produced on the foregoing chucks to good advantage are as follows: The outside forming and facing of all kinds of regular nuts both large and small; certain operations on valves and such like bodies; second and later operations on a wide variety of valve accessories; also all kinds of parts where one operation has been performed. Very good results can be obtained for concentricity if the chucks are kept



free of hard usage on the aligning fits and faces and the tools performing the operation are working correctly. For instance, if an auxiliary chuck gets out of true every article produced on that chuck will be out to the same extent or more so. Again, the chuck can be true and have a bruise on the face that the work sets against; this will produce the same result as an untrue chuck. Another cause of poor work is where the article is so designed that the face that sets against the chuck is too small to withstand the strain of forming, etc.; this causes changes in the faces that come in contact with the chuck.

According to the American Consul at Cartagena, Colombia, there is sure to be a demand for articles of gold and silver as soon as the economic conditions improve.

BRITISH NOTES.

DEPRESSION IN BIRMINGHAM JEWELRY.

There are great complaints in Birmingham of depression in the jewelery and silver trades. The shipping trade is very disappointing, and as usual, when the world's trade is bad, the first and severest sufferers are those engaged on ornaments or similar luxuries. To some extent, the Australasian dependencies have escaped the general depression, but the jewelery business there has been checked by the new Assay regulations. The special ground of complaint with regard to these is that they ignore the British assay. The general experience is supported by the jewelry export figures, which show a decline of £54,-980 in the value of "plate and plated and gilt wares so far this year. Retailers' stocks are heavy, and travelers are returning with discouraging reports, especially from the Northern Counties and Scotland. Such trade as is being done is for cheap stuff realizing small profits. So far, manufacturers have failed to realize any benefit from the Franco-British Exhibition, which it was hoped might bring some business to Birmingham.

THE DECLINE OF COINING.

The return lately issued by the Home Office, relating to prosecution, gives some interesting information on the nefarious practice of coining. During the year 1907, 22 were convicted for making counterfeit coin, 11 for possessing moulds or other implements, and 3 for gilding genuine coin so as to pass for superior values. A curious feature is that, in several cases, offenders pleaded that they had been induced to commence making false coins by reading illustrated and detailed accounts in monthly magazines of the process. One convict had commenced the manufacture of counterfeit sovereigns on a wholesale scale. Such publications have been severely commented upon by judges in previous cases. The Birmingham police state that coining in this city is declining, but taking the country generally it is remarkable that of 36 persons convicted no fewer than 24 were dealt with for the first time, and it is also significant that the charges of "making" counterfeit coin exceeded those for "uttering and possessing."

It is still true that Birmingham has lost its old distinction of leading in the making of counterfeit coin, but the offender is cleverer and more difficult to catch than formerly, owing to the fact that as a rule he is better educated, has a good knowledge of metallurgy, and produces better imitations than the clumsy artist of a quarter of a century ago. Lead is extensively used, but so treated as to give greater hardness to the coin, and a better ring. The marking round the rim is more skillfully done. A singular feature is that counterfeit coinage is always brisker when the market price of silver is low. The police also find themselves baffled by the smartness of these nefarious artists who take care never to carry their moulds with them, and almost invariably employ women to circulate the coins.

SOME RECORD FIGURES OF BRITISH COINAGE.

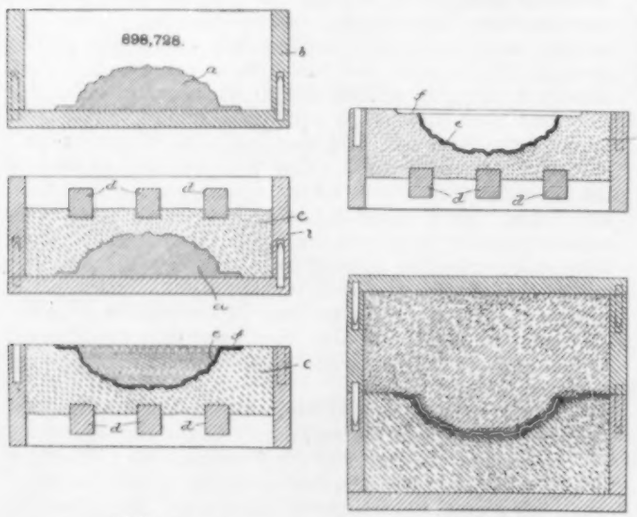
The figures recently issued relating to the work of the British Royal Mint are of a stupendous character, showing a huge output and a great increase. The Mint turned out 128½ millions of Imperial coins, an increase of 20 millions over the previous record of 1900. Colonial coinages also increased 20 millions, owing mainly to large aluminium coinages for African colonies and protectorates. The prominent position of aluminium, the value of which coins is considerably over eight millions, suggests a great future for this class of coinage. The sovereigns issued were of the value of £18,864,000 and of half sovereigns £2,087,000. The branch mints in Australia were accountable for £10,843,980. An interesting item relates

to the loss in light coins withdrawn from circulation. The average was 2.009d per piece, the lowest yet recorded. Since March, 1892, the total losses through light coinage have been £802,873. For the whole period, the annual charge was £50,000, but during the last four years it has fallen to about £31,000.

The Birmingham Mint figures prominently in the record with coins made for Canada, British North Borneo, Straits Settlements, Guernsey, and Sarawak. Several medals were issued by order of the King, including an Indian Distinguished Service medal, and a medal for gallantry in saving life in mines and quarries.

METHOD OF MAKING MOLDERS' PATTERNS.

The special object of an invention by Joseph F. Cox, of Watertown, Mass., patented September 15, 1908 (No. 898,728), is to obtain a hollow pattern of even thickness from a solid or block pattern without requiring any manual operation of backing out the original wood pattern. The method can be utilized for the production of ornamental cast metal ware in general. Heretofore the wood patterns used for this purpose have required the employment of wood carvers of considerable experience



FIGS. 1, 2 3. FIGS. 4-5.
METHOD OF MAKING MOLDERS' PATTERNS.

to "back out" or "shell" the pattern to reduce it to a substantially uniform thickness, the "backing out" being made of course to correspond with the raised ornamental portions on the face of the pattern.

Each of the accompanying drawings is a sectional view showing the steps in the new method. The solid pattern *a* is first placed on the bottom board of a flask and then the upper face of the pattern and the inside of the flask are coated with oil to prevent the plaster of paris from adhering. Then plaster is poured into the flask *b* to cover the upper surface of the pattern to a considerable thickness as indicated in Fig. 2 at *c*. When the plaster has set the flask is inverted and the bottom or mold board and the pattern are removed, the concave surface of the plaster being then uppermost. This is filled with water to uniformly moisten or cool the surface. Afterward the concavity is filled with melted wax and left long enough for a film to solidify in contact with the surface. This will require from 30 to 40 seconds for a thickness of ⅛ of an inch of wax. The surplus wax is poured out leaving the film *e*, which is practically of uniform thickness and which possesses an inside and outside configuration conforming to the surface of the original pattern.

Now the founder uses the wax pattern *e* to get his cope impression in sand, and the original pattern is employed in the usual way to get the nowel impression in sand. The cope and nowel are then assembled in the usual manner, the space between the two corresponding to the thickness that was given to the wax pattern or film. Provision is then made for the gates.

REACTIONS IN NICKEL-PLATING.

By Albert J. Hall.

When the wonderful discovery was made that the electric current could be made to decompose metallic salt solutions and deposit the metal on one of the electrodes of the cell, they knew not how, it did not require much experimenting to find out that nickel solutions could be easily decomposed, and that a bright, firm deposit of nickel could be made to adhere to a clean surface of metal. This discovery, together with the known physical and chemical properties of nickel, paved the way for the great commercial importance that nickel-plating has attained. The art of nickel-plating, however, never grew up scientifically. The *why* and the *how* of it all were not much sought for.

Nearly up to the present time, each plater made up his solutions in a sort of rule of thumb way, and then experimented with them in an unscientific manner until they worked. He knew that they worked well or poorly, but he was unable to tell why. It was often the case, that one man's excellent plating could not be duplicated by another man, even with the same solutions. Yet the cause of the difference was unknown and unsought for.

Now, times are changing. Science has cleared up many of the questions that existed. The theory of it all is now well known, and can be explained by the theory of ionization that now exists. Solutions are being made up in definite proportions, the causes of poor plating are being sought for and discovered by scientific men who are giving the results of their work to the public for the sake of general betterment of the art, and the reactions taking place in the bath during plating are being studied in the light of recent hypotheses proposed since the ionic theory was established.

A short time ago Mr. Brochet presented before the Chemical Society of France a paper on the reactions in the nickel-bath. It can be found in Bull. Soc. Chim. Series (4) Vol. 1-2, pages 1,109-1,112. It is an excellent article and I have attempted the translation, hoping that the public might get some benefit from it. I have endeavored to give a very free translation in order that no misunderstanding may exist or doubts arise in the reader's mind, and yet to retain the exact thought of the writer in the original French. The translation follows:

"At the present time nickel-plating is a wide-spread operation, but the theory has been but little studied. However, the complex reactions, capricious in appearance, may be regularly defined.

"Although the deposit of copper takes place well in strong acid solution, the deposit of nickel requires a neutral bath. Still a slight acidity gives a white deposit. The presence of much free acid, however, that is to say, the presence of the hydrogen ions, brings about a liberation of hydrogen at the cathode, and the deposit collects in the form of scales which are not very dense.

"The peeling off of the nickel deposit is due to the occlusion of hydrogen, which always exists, however, in the electroyltic deposits of cobalt and nickel.

"In the presence of sulphates we can prove the libera-

tion of sulphuric acid and oxygen. This proves that the nickel is passive, and that it acts like an insoluble anode. The passivity decreases in proportion as the acidity increases. In the case of the chloride, however, this does not exist.

"The electrolysis of nickel salts gives poor results if they are used alone. In the case of the chlorides, the nickel is deposited on the cathode as hydrated oxide of nickel, more or less mixed with the oxychloride. In the case of the sulphate, this hydrate does not form, due to the acidity resulting from the passivity of the anode.

"The presence of alkali salts is, therefore, necessary for successful operation. With the sulphate of nickel it gives complex salts which dissociate into cations-ex. NH and anions (So_4) Ni. The ions have their charge neutralized by that of the nickel ions furnished by the anode. There is a formation of nickel sulphate, however, and as we have seen, ozygen and sulphuric acid.

"Finally we find or observe a deposit of nickel peroxide on the anode, resulting from the intermediary formation of unstable nickelous sulphate. The addition of alkaline nitrates to nickel sulphate does not modify the passivity of the anode. There are no more deposits of nickel or liberation of hydrogen at the cathode, but simply the reduction of nitrates to the state of ammonia. However, the inverse reaction equally takes place, and the ammonia perhaps oxidizes at the anode giving small quantities of nitrates in the bath.

"The addition of chlorides to the tank suppresses the passivity but does not modify the reactions.

"The reaction that takes place at the anode does so by the intervention of the anion $Ni\ Cl_4$ which tends to form the peroxide. This is the principal inconvenience in the addition of chlorides (conducting salts) to the nickel bath. A certain proportion of nickel is thus unutilized.

"Whatever the electrolyte may be, the deposit of nickel at the cathode arises from a secondary reaction resulting from a discharge of cations (NH_4), and from a decomposition of the single sulphate, if it is in excess. On the other hand, a certain part of the cations are discharged to the detriment of the elements in solution. There is a liberation of hydrogen simultaneous with the formation of alkali which is neutralized in the case of a tank containing only the sulphates.

"In the presence of chlorides, as the solution remains neutral, the hydrogen results in the formation of the hydroxide of nickel which diffuses in the tank. However, a part may, without having been previously liberated, be precipitated simultaneously with the nickel, giving the gray deposit and the bad appearance which one observes under these conditions. If the presence of hydroxide increases, the acidity of the bath must be looked after.

"The acidity may be corrected immediately by adding ammonium hydroxide. This process, however, is not without its inconveniences. The bath generally has admixtures of nickel sulphate and double sulphate of nickel and ammonia. One is often more interested to find the nickel content of the bath. Nickel sulphate is very soluble, but the double sulphate is more soluble, the solubility reaching about 100 grams to a liter at 18 degrees Centigrade. The solubility is diminished considerably by the increase of ammonium sulphate.

"The neutralization of the liberated acid by ammonium hydroxide corresponds to the replacement of a certain quantity of nickel sulphate by an equal molecular quantity of ammonium hydroxide, and leads to the crystallization of the double sulphate as soon as the solution reaches saturation. It is best to neutralize the acid by hydroxide or carbonate of nickel, though they are relatively expensive substances, or by calcium carbonate, or better still, barium carbonate. The inconvenience is also remedied by adding salts of the acids little dissociated (organic acid) such as the citrate of sodium. It does not give off more hydrogen ions and consequently does not give more inconveniences. These salts are expensive, however, but they maintain well the life of the bath. These acids are finally decomposed under the influence of the electric current.

"In actual practice one often prefers to operate in the presence of the chloride. We have seen their inconveniences, however. They can be remedied by adding boric acid to the bath. This does not combine with nickel hydroxide and is scarcely ionizable. It has no other effect than to compensate the action due to this hydroxide which is less dissociated, and to give to the deposit the whiteness which the presence of this hydroxide tends to make it lose.

"The more or less great passivity of nickel depends only on its physical nature, varying according to the rolling to which it is able to be subjected from the fact of its purity, and not to its purity alone.

"Nickel in fusion possesses the property of breaking up into oxides which tend to deaden it and to hinder its final treatment. It is possible to do away with this oxide by means of magnesium and aluminum, etc.

"Rolled nickel in sheets of one-half millimeter thickness cannot enclose this oxide. It possesses in the highest degree the phenomenon of passivity. With a current density of about one-half ampere per square decimeter, the attack which we could have obtained is less that five per cent. of the theoretical quantity either with a solution of a double sulphate of nickel and ammonia of 100 grams per liter or with a solution of nickel sulphate of 150 grams per liter with the addition of 50 grams of the double sulphate, or 20 grams of ammonium nitrate.

"The rolled anodes of commerce in plates of five to eight millimeters thickness present much less the phenomenon of passivity. It is a well-known fact that the cast anode dissolves much better than the rolled ones. They are, in general, a little less pure than the rolled ones, for in their manufacture a certain proportion of wasted old anodes is used. The proportion has become so great that the cast anodes are less and less in demand.

"We have seen, previously, that the passivity of the bath diminishes in proportion as the acidity increases. The inverse takes place in the case of the deposit of nickel. If we make a deposit with the previously indicated solution to the exclusion of the content of ammonium nitrate by using, as an anode, a thin sheet of nickel, the deposit on the cathode is theoretical and the solution of the anode is insignificant. As a result, the bath becomes more and more acid, and consequently the attack on the anode increases as does also the liberation of hydrogen on the cathode. The deposit of nickel on the cathode diminishes. These phenomena are more and more apparent as the current density is raised.

"The attack of the anode under conditions for good plating of nickel is a specific one. It is characterized by giving rise to cavities which enlarge more and more as the plating continues and which lead to deep perforations in the electrode. Other parts of the electrode preserve their thickness.

"We intend to study this phenomena which is probably connected with the passivity more, and to relate more on the subject later."

Last June the Straits Settlements sent to the United States 2,803,606 pounds of tin, to England 5,614,266 pounds and to France 1,535,600 pounds. All other countries 582,799 pounds.

THE PLANT OF HEGELER

THE PLANT OF HEGELER BROTHERS.

The main office of this plant is located at the smelter, about three miles south of Danville, Ill., directly over a large tract of coal land owned by the firm, which they expect later to mine for their own consumption. The shipping facilities are of the best, there being direct connection over their own tracks with the Cairo division of the Cleveland, Cincinnati, Chicago & St. Louis Railway; also with the Chicago & Eastern Illinois Railroad of the Frisco System; both of these roads switch to the Wabash Railway System's main line.

The plant is equipped with electric power throughout, with a central power plant tri-phase transmission designed by W. L. Fergus & Company, of Chicago, consulting engineers. The equipment was furnished by the General Electric, National and Westinghouse Companies. There are Ball engines, Ingersoll air compressors, Stirling boilers, Cochrane special feed water heaters and Green chain grates.

The engine house is a reinforced concrete building. The clay working department is brick, and the other buildings are steel frame and wood with corrugated galvanized iron covering.

All special machinery and equipment were built at the plant, the machine shop being fully equipped for work of this class. The calcining kiln is a modification of the Hegeler Kiln, and the furnaces are a modification of the Hegeler Furnace, the original of which has been in operation at the Matthiessen & Hegeler Company's Zinc plant in La Salle, Ill., for some years.

The rest of the plant, exclusive of the power plant, was designed, built and equipped by the owners, Julius W. and Herman Hegeler, sons of Edward C. Hegeler, of the Matthiessen & Hegeler Zinc Company. Prior to the building of this plant they were connected with the above company. E. C. Hegeler is recognized as an authority in the zinc smelting business. Matthiessen & Hegeler established the plant at La Salle in the late fifty's. The new firm is absolutely independent of the M. & H. Zinc Company; there being no connection between them other than the relationship of in the Hegeler family.

The plant is modern in every detail and smelts high grade virgin metal only from the best Southwest Missouri ores. They manufacture also high grade 60-degree Baume sulphuric acid. The capacity of the plant is about 95,000 tons of spelter and 180,000 tons of sulphuric acid.

Pearl fishing is being carried on with increased activity in the waters of Madagascar. A concession has been granted to a prominent company for pearl fishing on the northwestern shores of the island.

THE ELECTRODEPOSITION OF ALLOYS.

It is a more or less difficult matter, when depositing brass and similar alloys, to maintain for any length of time an alloy of the desired composition. This can be varied within certain limits by varying the relative percentages of the metals in the solution, through the adjustment of the temperature of the electrolyte and the current density with the corresponding increase or decrease in voltage. But this regulation is not sufficient for the deposition of an alloy of any thickness, for instance, brass sheets or tubes.

An invention by Sherard O. Cowper-Coles, of London, England, issue September 8, 1908, No. 898,189, aims to overcome these troubles and to provide means whereby the composition of the alloy deposited can be effectually controlled. This is done by employing, in addition to an anode of the alloy to be deposited, say brass, anodes of copper and zinc which can be connected to the circuit which supplies the current passing through the brass anode. Resistances are inserted in the conductors which convey the current to the copper and zinc anodes, so that the amount of current flowing through these anodes, and as a consequence, the amount of metal that goes into the solution, can be regulated. It has been found in practice that good results can be obtained with such an arrangement of anodes by employing an electrolyte composed of double cyanides of copper and zinc potassium. The specifications state that excellent results have been reached with an electrolyte prepared as follows:

A 10 per cent. solution of cyanide of potassium is brought to the point of saturation by passing an electric current through a brass anode, the cathode being protected by a porous pot, and the electrolyte being then worked under the condition already mentioned, small quantities of cyanide of potassium being added from time to time as found necessary.

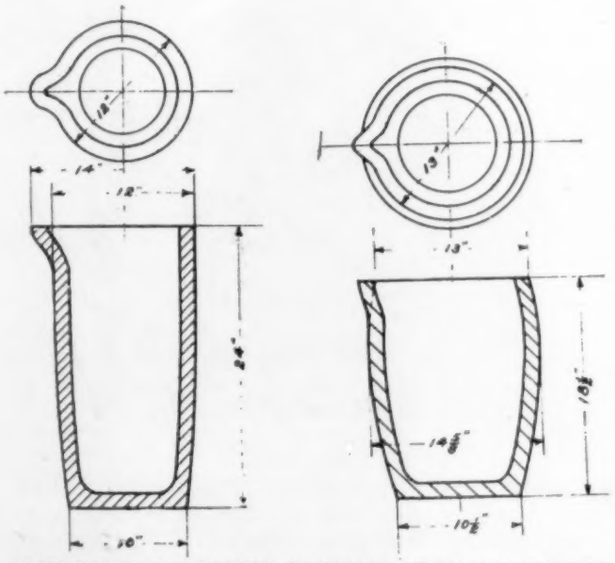
BELGIAN ZINC INDUSTRY.

According to the American Consul at Liege during 1907, the ten zinc works of that province produced 129,010 metric tons of crude zinc valued at $14,705,934. The average price per ton fell from $128 to $114, representing a shrinkage of 11¼ per cent, while the total production experienced a trifling increase of 300 tons. Of the zinc ore consumed, Belgium only produced 2,235 tons; Italy and Sardinia produced 69,480 tons, Spain and Portugal 62,299 tons, Australia 54,807, Algeria and Tunis 42,754 and Sweden and Norway 24,203. The price of zinc fell from $140 to $132, a decline of $8 in 1907 as compared with the price in 1906. The nine zinc works in the district produced in 1907 42,340 tons of zinc plates, representing an increase of 495 tons as compared with the previous year.

BROTHERS, DANVILLE, ILL.

CRUCIBLE FOR THE NEW ROCKWELL MELTING FURNACE.

Every melter of metals is well aware of the harmful effects of oxidation and to the best of his ability protects his metal during the heating. With the common arrangement of furnaces he is limited in this endeavor since it is impossible to completely cover the metal surface. In addition to this the standard form of crucible, with its low height and bulging sides, does not lend



ROCKWELL AND STANDARD CRUCIBLES OF SAME CAPACITIES.

itself readily to any method of protecting the surface of the metal it contains.

In the new Rockwell crucible, especially when taken in connection with the furnace it is intended to be used with, provision is made for the rapid and economical melting of the metal and for its protection during the melting. The furnace is composed of practically two chambers, one for combustion and the other for the crucible, connection between the two being made at the bottom. The burner is placed on top at the back and the flame is directed downward into the combustion chamber from which it passes to the crucible which it completely surrounds.

The principal difference between the new and the old forms of crucible will be readily perceived from the two accompanying sketches. These drawings show the No. 2 Rockwell and the ordinary No. 150, the capacities being about the same in both, or 400 pounds. It will be noted that the first is 24 inches high as against 18½ inches in the latter, and 12 inches outside diameter against 14⅝ inches. The bilge is not required in the new form since it is not lifted from the furnace, which is of the tilting type; the cover need not be lifted during the pouring and the metal is not exposed. If the crucible breaks all metal is retained in the furnace without possibility of chilling, and may be poured conveniently and without loss either from the pouring spout or from the opening in the rear.

These crucibles are used with furnaces having capacities of 200, 400, 800 and 1,600 pounds. They can be obtained from all the prominent crucible manufacturers and at prices the same as the old shapes of the same capacity.

MAKING IRON TANKS ELECTROLYTICALLY.

It is well known that when iron is deposited it tends to contract, and unless special provision is made to overcome this, the contraction will result in the metal cracking. In addition to this the iron so deposited is extremely weak and brittle. These defects are done away with in the process patented by Thomas A. Edison, September 8, 1908, No. 898,404, and by him assigned to the Edison Storage Battery Company, of West Orange, N. J.

This is an improved process for making articles by electroplating, such as cans for use with storage batteries. These cans are made of iron and the deposition is affected in the following manner: A mold of the right shape is made of copper or brass and is coated with a very thin coating of paraffine by dipping in the hot wax. This form is then coated with graphite and forms the cathode. The form is first coated with a very thin shell of copper about .004 inch thick; it is then coated with nickel about .001 inch thick, after which it is ready for the iron. This solution consists of ferrous ammonium sulphate, $Fe(H_4N)_2(So_4)_2$. This bath must be free from any traces of acidity, or of ferric salts, which affect the character of the plating. The current is from 1 to 1.2 amperes per square decimeter of surface. A quantity of crushed charcoal is introduced into the tank which, rubbing against the surface of the deposited metal as the form revolves, will wipe off any gas bubbles. A portion of this carbon is deposited with the iron so that the finished product is a superior quality of mild steel, containing according to analysis about 4 per cent of carbon. As a result it is tougher and more rigid than when made of pure iron.

The output of flake graphite during 1907 showed a marked decrease, the total production being the smallest since 1903. The yield was 22,939 short tons, valued at $1,777,389. Artificial graphite was produced to the extent of 6,590,000 pounds valued at $481,239, or 7.30 cents per pound.

INDUSTRIAL

NEW AND USEFUL DEVICES, MACHINERY AND SUPPLIES OF INTEREST TO THE READERS OF THE METAL INDUSTRY.

THE IDEAL TILTING CRUCIBLE FURNACE.

The new tilting crucible furnace for melting copper, tin, bronze, aluminum, etc., manufactured by the Ideal Furnace Company, of Scottdale, Pa., retains all strong

FURNACE EMPTY—GRATE BARS IN POSITION.

and well-known features of a pit furnace, combined with the more modern method of pouring by tilting. The crucible is not removed from the fire and the furnace is always ready for coking or coaling. Any required amount of the charge can be poured from the crucible

FURNACE UNDER BLAST.

and the balance left in the furnace, which will hold its temperature for 1½ hours with no additional fuel, since the air blast is shut off. By this method a heat or parts of a heat may be held in the crucible until it is convenient to cast, with no bad effects such as over heating or oxidization. As a large volume of air is required, a low pressure blower is used, which tends to reduce oxidation.

The furnace is made of 3/16 sheet iron and is composed of two pieces, the main body and the locking ring. The body of the furnace, which rests on two trunnions, is lined with fire brick and carries its own grate bars and locking ring. This ring connects the furnace with the air supply base when in operation and is locked to the body when pouring. The lining is made of 5-inch fire brick, and the two special top bricks are made removable.

The furnace is of 600 pounds capacity and occupies a floor space of 6 by 6 feet and is 44 inches high over all. The coke consumption is 40 pounds of coke per

BLAST OFF, FURNACE READY TO TILT.

100 pounds of metal melted; the air pressure is 1 ounce. Tests presented show that the loss in melting is extremely light and that metal can be poured in an hour and a half or less from the time of starting the fire.

This company is composed of P. J. Sweeney, president, formerly of the Rockwell Engineering Company, and W. J. Holzapfel, secretary and treasurer, foundry superintendent of the Crescent Manufacturing Company. Mr. Holzapfel is the patentee. Patents have been issued in the United States and Canada, and have been applied for in Great Britain, Germany, France and Belgium.

The United States Sherardizing Company, of New Castle, Pa., owners of the United States patent covering the "Sherardizing" process of dry galvanizing, report that cast iron can be Sherardized if it is properly cleaned. It is necessary to take off the outer coating, which is composed generally of silicon, either with a sand blast or acid to let the zinc dust come in contact with the iron itself. If this is done, very good results are obtained.

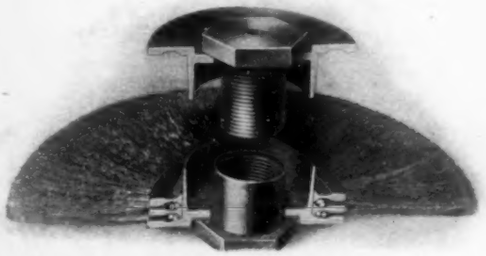
A press item reports that a manufacturer of aluminum wares at Ludenscheid, Germany, has placed on the market souvenir spoons made from the aluminum which formed a part of the Von Zeppelin airship which was wrecked

on August 5, 1908. One side of the spoon handle bears the date of the disaster and a fac-simile signature of Von Zeppelin. On the other side there is in relief a view of the airship sailing over a city and the inscription, "Cast from the remains of the Von Zeppelin airship."

THE ECONOMY WIRE WHEEL BRUSH.

The "Economy" wire wheel brushes made by the Osborn Manufacturing Company, of Cleveland, O., are used for cleaning castings and metal patterns, for removing scales from hot forgings, axes, shovels, etc., and for cleaning brass and sheet copper, for which purpose they are made with concave face. It is stated that stove castings which are to be nickel plated can be more thoroughly cleaned by the use of these brushes, and a finer finish produced, than can be obtained by any other process. By the company's patented method of construction the wires support each other instead of being separate and independent; this makes a solid mass of intermingled wire, which continues to scratch even with the hardest usage.

The hub of the wheel can be refilled with wire by any operator. The brush part is made in disks or sections, very much the same as cotton buffs, as shown in the accompanying engraving. These sections are separated by dividing rings and held together by face plates and a steel sleeve nut. When these sections are worn out they can be replaced in a moment's time. The same hub is used for years and a set of sections or refillings costs less than one-half the price of the original brush complete.



SECTIONAL VIEW SHOWING CONSTRUCTION.

OBLIQUE PLATING BARREL APPARATUS.

The tedious and costly method of plating quantities of small articles in wire trays or baskets led to the introduction of the horizontal plating barrel. The great success attending the use of this apparatus since its introduction by the Hanson & Van Winkle Company, of Newark, N. J., has induced that company to place on the market their oblique plating barrel, which is here illustrated. This machine is simple in construction, very durable, and will be found extremely useful in all plating shops where not enough of the small work is regularly handled to warrant the expense of installing the larger apparatus.

OBLIQUE PLATING BARREL APPARATUS.

The barrel is made in cylinder form of material which resists the action of the solutions, and is so constructed that no part of the apparatus itself will receive the metallic deposit from the anodes. The barrel is suspended in the solution at an oblique angle by a mechanical arrangement at the top of a tank either at the end or on the side. The drive is from the outside, avoiding the necessity of having a belt or chain running in the solution. The barrel may be driven either from a countershaft or direct from a small motor.

A rigid swinging hanger allows the barrel to be raised or lowered with ease and without interfering with the drive. These movements are controlled by the projecting shaft, on the end of which is a swivel handle. In this manner the work can be examined at any time without stopping the machine.

The barrel can be lifted to an angle sufficiently high to empty the contents into a basket or container that may be placed under it, or by loosening a wing screw nut the entire barrel may be removed with the work in it and used as a dipping basket for rinsing purposes.

When a barrel is rigged in this manner it can at once be removed and the space it occupied in the tank can be used for still plating when required.

This apparatus can be successfully used in plating with nickel, copper, brass, bronze, zinc, silver and gold solutions. It is made in four sizes having capacities ranging from 10 to 40 pounds of screws, nails or similar articles. When desired several of these barrels of the same or varying sizes can be operated in one solution tank, each plating work of different size or character that may be kept in separate lots when desired.

RUBBER VALVE DISCS.

Manufacturers and users of valves will be greatly interested in the recently improved method of manufacturing and finishing rubber valve discs. While the valves themselves have changed and improved in many ways during the past several years, the manufacturers of dics have not produced anything of importance that was new or different.

Two general methods of making dics have been in use —the one generally accepted as the best is the molding process, as it insures greater density and firmness, while the other method of tubing the rubber into long rods and cutting to proper thicknesses is used by one or two companies.

The straight molded disc is subject to the many unavoidable imperfections on the surfaces that makes it far from satisfactory. As it is absolutely necessary to have perfectly parallel faces to secure good work from a valve disc, it must be accurately finished in some way, and grinding seems to be the only feasible one. Many schemes for doing this have been tried, but on account of the small size and the required handling none of the methods heretofore used have been entirely successful.

A special rubber compound of well known quality has for years been used by Morgan & Wright, of Detroit, Mich., in their line of valve discs, giving uniformly satisfactory results and emphasizing the importance of a more perfect mechanical finish than that possible to produce from molds alone. This resulted in efforts being concentrated upon the designing and construction of the special grinding and facing machines now in operation.

These machines are automatic and of micrometer adjustment, grinding the discs uniformly to a standard thickness with both faces true and absolutely parallel. Valve manufacturers are enthusiastic over this high quality valve with its perfection of mechanical handling, for they appreciate how greatly it increases efficiency of their valves. In order to greater protect their reputation and to further their desire to make the Morgan & Wright discs the best on the market, each passes two rigid inspections before ready for the stock room.

Morgan & Wright report a most gratifying demand for these valve discs, it being necessary to operate both day and night to fill orders.

GEARED FRICTION HEAD TURRET LATHE.

The geared friction head turret lathe built by the Foster-Kimball Machine Company, of Elkhart, Ind., is so designed that perfect adjustment is always certain and the parts are so proportioned that breakage is almost impossible.

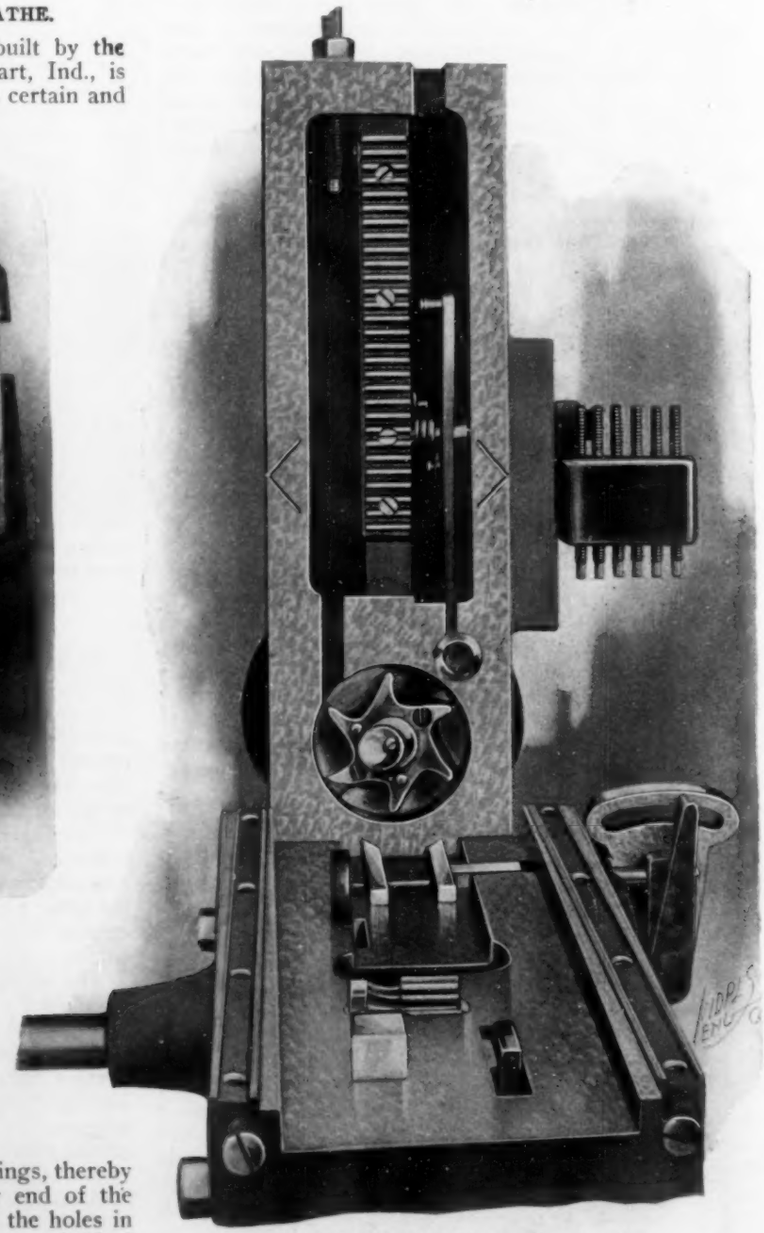
HEADSTOCK BOXES.

The construction of the headstock boxes will be clearly understood from the accompanying engraving. The boxes are planed at an angle on the bottom and a taper wedge of the same angle is fitted under them. This wedge is adjusted sideways by screws shown in the side of the housings, thereby making it possible to raise or lower either end of the spindle, bringing it in line with the bed and the holes in the turret. The housings extend above the upper half of the brass box, which does away with all side strain on the cap screws.

The second engraving is an inside view of the slide and saddle, in which particular attention should be called to the independent stop construction. On the bottom of the ratchet is a small cam which fits into the fork shown in the top of the saddle. This fork is a part of the small cross slide and controls the upright lever on the outside of the saddle. This lever oscillates in front of the six stop screws on the slide.

The cross slide is placed in the saddle at the point where the turret revolves, thus placing the upright lever in front of the screw that corresponds with the hole in the turret facing the spindle.

In the forward movement of the turret the cam leaves the fork so that in case it is desired to pass all stops this can be accomplished by moving the lever out of the way of all screws.



INSIDE VIEW OF SLIDE AND SADDLE.

The simplicity and convenience of this construction will be appreciated.

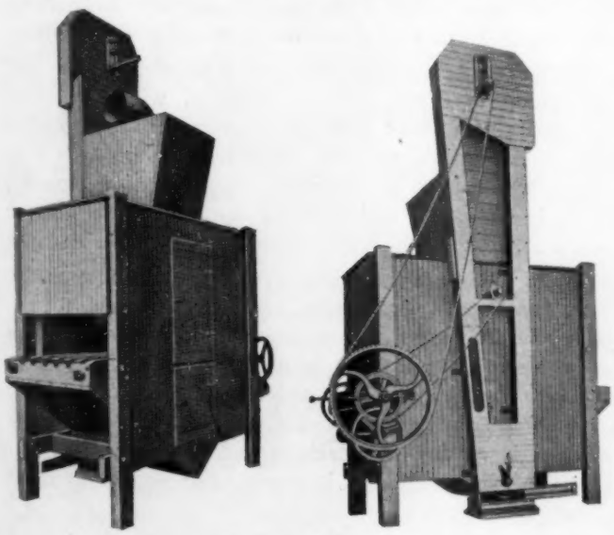
This lathe is made in four sizes having the following dimensions:

	No. 3.	No. 4.	No. 5.	No. 6.
Swing	14	16	17	20
Wire feed capacity.	1 5/16	1 9/16	1 12/16	2 1/16
Diameter of hole in spindle	1 9/16	1⅞	2⅛	2 7/16
Diameter of turret..	7¼	8½	8½	10
Diameter of holes in turret	1¼	1½	1½	2
Center of turret to top of slide.....	2¼	2 15/16	2 15/16	4
Distance end of spindle to turret.....	16	24	24	25⅛
Length that can be turned	7	10	10	18
Largest diameter of cone	10½	12	12	13
Speed of countershaft for brass...	280	240	200	200
Spindle speeds	186	160	160	138
	314	265	265	219
	536	445	445	350
Speeds with back gear	34	32	32	26
	57	53	53	42
	97	89	89	67
Weights, net.. (lbs.)	1700	2000	2100	2800

The machines occupy floor spaces as follows: No. 3, 2 feet 8 inches by 6 feet; No. 4, 3 by 7 feet: No. 5, 3 by 7 feet, and No. 6, 3 feet 2 inches by 8 feet.

THE JORN SAND BLAST.

The sand blast here illustrated, manufactured by A. A. Jorn, Jr., Waukegan, Ill., is the result of ten years' experimenting. The machine is not only very simple and durable in construction but it is also very easy to operate. While in operation there is no need of constantly stopping to collect and screen sand, as the machine is so designed that it takes care of these difficulties itself, using the sand over and over again, the sand never leaving the machine until it becomes dust and disappears



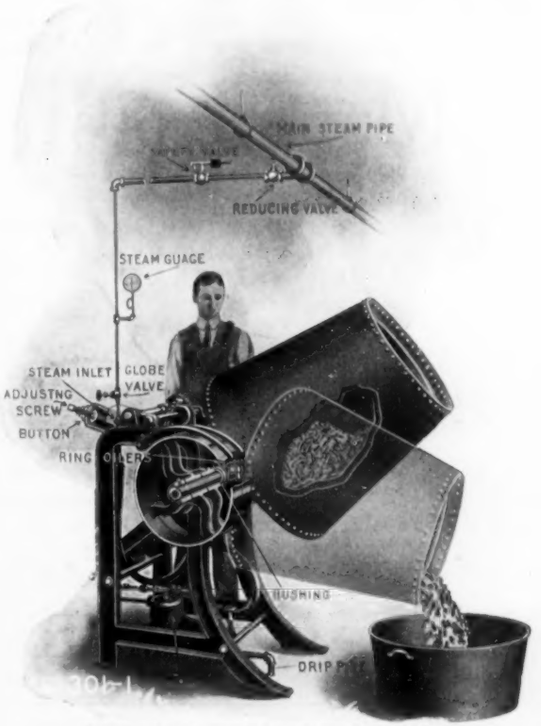
THE JORN SAND BLAST.

through the exhaust pipe. For sand blasting glass this machine is claimed to be superior to any other.

The standard 18-inch size will sand blast an area of from 150 to 180 square feet per hour.

THE BAIRD STEAM DRYING BARREL.

This barrel is designed for drying small parts of wire or sheet metal with hot sawdust after they come from a wet tumbling process or plating solution. The barrel proper is in the form of the frustrum of a cone and is



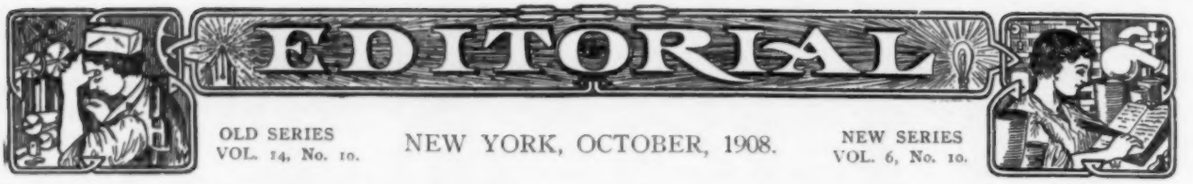
THE BAIRD STEAM DRYING BARREL.

constructed with an outer and inner shell which forms the steam chamber. The barrel is fixed on the end of a shaft which is rotated in a carriage that is movably mounted at its front end to brackets secured to the standards. Provision is made for rotating the barrel and also for raising it to the operating position and lowering it for emptying the contents. This is the only steam heated tumbling barrel that can be tilted from the highest to the lowest position, and at the same time automatically eject or dispose of the condensed steam.

The best results are obtained by running with a steam pressure of from 15 to 20 pounds in the barrel. Although all these machines are tested under 60 pounds of steam the makers do not advise their operation under greater pressure than 20 pounds. The condensation is taken out at the outlet pipe at the back of the machine near the floor. This may be provided with the smallest steam trap made, which will easily take care of the condensation.

With the steam heated barrel the capacity is much greater than with the hand method; the floor space required is less, and the labor and time required are considerably shortened, as more heat is retained in the barrel which, with the operation of tumbling, thoroughly dries the goods and the sawdust, and the fact that the sawdust is thoroughly dried greatly shortens the time required to dry the next batch. Some users of these barrels state they can dry six times as much work as can be done by the old process of drying in a steam pan. Another advantage possessed by the barrel is that the results are much more satisfactory from the fact that the operation of tumbling not only more thoroughly dries the goods but brings them out with a much brighter finish.

These barrels are manufactured by the Baird Machine Company, of Oakville, Conn.



OLD SERIES VOL. 14, No. 10. NEW YORK, OCTOBER, 1908. NEW SERIES VOL. 6, No. 10.

THE METAL INDUSTRY

THE CONSOLIDATION OF
THE ALUMINUM WORLD
THE BRASS FOUNDER AND FINISHER
ELECTRO-PLATERS' REVIEW
COPPER AND BRASS

Published Monthly by
The Metal Industry Publishing Company
(Incorporated)
61 BEEKMAN STREET, NEW YORK CITY
Telephone No. 4983 Beekman Cable Address, Metalustry

PALMER H. LANGDON, ... *Editor and Publisher*
S. D. V. BURR, ... *Managing Editor*
JOHN B. WOODWARD, ... *Director*

Subscription Price, $1.00 per year, postpaid to any part of the World.
Single copies, 10 cents

ADVERTISING RATES ON APPLICATION

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ENTERED FEBRUARY 10, 1803, AT NEW YORK, N. Y., AS SECOND CLASS MATTER UNDER ACT OF CONGRESS MARCH 3, 1879.

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THE FOUNDRY SUPPLY ASSOCIATION.

Recently there has been a rumor in trade society circles that the Foundry Supply Association was planning to break away from the American Foundrymen's Association with which it is affiliated and holds joint conventions, and form a distinct organization of its own. In order to get the facts in the case we applied to the President of the Foundry Supply Association and herewith have the pleasure of publishing his reply:

To the Editor of THE METAL INDUSTRY:

Replying to your communication of Oct. 7th I desire to say, by a recent vote of the members of the Foundry Supply Association, the large majority voting agreed to change the name to the Foundry & Manufacturers' Supply Association, the sole object being to increase the interest in our annual meetings by allowing any machine tool or other article to be exhibited in connection with the foundry supplies. The attendants are largely representatives of manufacturing concerns who would be interested in seeing any article of merit on exhibition.

There is not the slightest disposition to hold an independent exhibit, but on the contrary, to affiliate with the other organizations as heretofore, and if possible to make the meetings more interesting by enlarging the scope as well as the membership. It is not the purpose of the Foundry & Manufacturers' Supply Association to antagonize any affiliating organization in any possible manner, but to assist them in building up their membership and attendance at the annual meetings, by making the exhibit feature as attractive as possible.

In the brass goods line there are a number of new and interesting machines, that if exhibited would be very attractive to a large number of your members of the Brass Association, and the manufacturers of such machines would have an excellent opportunity of showing them in operation and meeting the parties they most desire to reach. This is true of any and all other devices.

There is nothing especially new in the change, as the Foundry Supply Association has never refused to exhibit any article, but it was thought desirable to change the name so that it might be more fitting and attractive to the manufacturers and supply men.

It would be very desirable for your paper to co-operate with us in getting the machine tool men and others to join the organization, as it would be beneficial to them as well as to your paper.

Hoping I have made this situation clear to you, I remain,

Yours very truly,
F. W. PERKINS, Pres.

Freeport, Ill., Oct. 11, 1908.

THE METAL INDUSTRY is certainly glad to co-operate with the Foundry Supply Association in getting machine tool builders and others to join the organization and we believe that the action of the association has been most wise in taking a new name which is comprehensive —one that will appeal to foundry supply men who furnish the machinery and supplies for making castings, also a name that will appeal to the machine tool builders who furnish the machinery for finishing the castings. The two branches of manufacture (casting-finishing) certainly go hand in hand in the industrial world.

The change of the name also emphasizes the fact of how important it is to have a right title, one that by its very speaking will tell the object of its mission. THE METAL INDUSTRY has cited this point before in the formation of metal societies and will say nothing further on the subject at present, as the change of name in the Foundry Supply Association proves the position we have taken in the past regarding metal societies.

CRITICISM AND COMMENT.

Our "Criticism and Comment" pages have grown to such an extent that in this number we publish five columns of letters on topics which are of daily interest. This is certainly a very good sign that the metal industry has now reached the stage where it believes in a thorough discussion of each other's methods of manufacture, and we are pleased to make our journal the medium for a general exchange of practical ideas. On the page mentioned are found opinions on "Cleaning (or not cleaning) Nickel Anodes," "Machine Molding," "Silver Finishing and Polishing," "Gun Metal Finish," etc., and these opinions are written by men who have given considerable study to the problems which are under discussion. It can readily be seen how instructive is this general criticism, comment and discussion. These views on the industrial problems of the hour are as interesting technically as have been the recent Presidential candidates' opinions politically.

AMERICAN MACHINERY IN EUROPE.

A noticeable feature in modern manufacturing is the way in which manufacturers buy equipment in various parts of the world and then in turn supply their own products to the very countries from which they bought their equipment. This fact was forcibly brought to our attention in a recent visit to foreign industrial works wherein Great Britain American machinery could be seen in the rolling mills and the wire drawing establishments, though naturally by far the larger part of the equipment was made in Great Britain. It was our good fortune, however, to inspect a machine shop in Germany where nine-tenths of the machine tools and the hand tools were made in the United States. The manufacturer, however, was building rolling mill machinery, which he sold to the United States, Great Britain and other industrial countries. The owner of this plant had spent two years of his life in American machine shops and knowing the speed and quality of the machinery built here, equipped his German shop accordingly. Where he wished speed he put in American tools and an inspection of his factory disclosed the names of the well known makers. By taking this broad view of buying machinery in the country which makes the best for his class of work, the manufacturer was able to compete in the world's markets. In passing we compliment the American manufacturers that in competition with the entire world they were able to supply nine-tenths of the machinery for a German machine shop.

SHOW THY LIGHT.

"Neither do men light a candle and put it under a bushel, but on a candlestick and it giveth light unto all that are in the house."

We quote this good old text, for in a commercial sense we have an exemplification of it in this issue, since to the best of our knowledge and belief we publish for the first time a complete illustrated description of a metal rolling mill—interior views as well as exterior. Heretofore only parts of the equipment of a metal mill have been published. For many years it has been a matter of pride with the iron and steel industry to have shown in the various trade journals all that was best in design and construction, but the brass and copper industry has kept "its light under a bushel," so to speak. Now that the Michigan Copper & Brass Company has blazed the way and set an enlightened example for others to follow, we hope that we may have the opportunity of presenting all that is newest and finest in metal rolling mill interiors. There is even the opportunity to go our friends of the Middle West one better, for they have not been able, through a force of circumstances rather than desire, to give out as many detailed technical facts about their machinery as is desirable from our standpoint. We trust, therefore, that the next mill that we have the pleasure of illustrating and describing will be in a position to present technicalities in detail as have the various foundries, smelting shops and metal working establishments that we have shown in our reading columns—let thy light shine through THE METAL INDUSTRY pages that customers may see your good works.

Last year the lead production of the Eastern States amounted to 140,599 pounds, valued at $7,451. The lead ores yielded an average of 189.8 pounds of metal to the ton. This production came from New Hampshire, Georgia and most of it from Virginia.

During 1907 the spelter production of the Eastern States amounted to 22,748,093 pounds valued at $1,364,673. The zinc ores yielded 100.2 pounds of metal to the ton. New Jersey was the leading State with 22,529,550 pounds, which was obtained from the famous mines at Franklin. Tennessee yielded the balance, 218,643 pounds.

All the gold and silver mined in the United States does not come from the West. Last year the production of gold, silver, copper, lead and zinc in the Eastern States had a value of $5,729,998. This output was obtained from 105 producing mines, of which 59 were placers. The gold product was 11,605 fine ounces and the yield of silver was 85,661 fine ounces. The total value of the precious metals was $296,438.

WE CORDIALLY INVITE READERS' OPINIONS AND CRITICISMS OF ALL ARTICLES PUBLISHED IN THE METAL INDUSTRY. SUGGESTIONS WELCOME.

CYANIDE COPPER AND BRASS SOLUTIONS.

To the Editor of THE METAL INDUSTRY:

In reply to the criticism appearing in the August number, signed "Subscriber," I would say that the cyanide used in my tests is one furnished by the Finkell-Hachmeister Co., who also furnished the red copper compound used at the same time. In making solutions with red copper compound, I found that the average cyanide of potassium, especially the so-called German cyanides, failed to take up the required amount of copper. There are many so-called high grade cyanides of potassium on the market, which, while passing the test regarding the amount of silver taken up, still contain so much dead salts as to make the working of same very expensive.

Most platers have experienced trouble in plating steel knives owing to pitting of same, and have only overcome this difficulty by reducing their solution. This trouble, as is readily seen, is caused, in the majority of cases, by the amount of dead salts contained in the cyanide. Where too much bi-sulphide of soda is used in making a saturated or stock solution, trouble may be experienced in taking up the copper, as the solution being saturated with soda and cyanide, it cannot accommodate the copper. If our friend will try slightly heating the water in which his cyanide is dissolved, then adding his red copper compound slowly, stirring vigorously, I think he will have but little trouble in accomplishing his desire.

C. S. BARBOUR, JR.

SILVER FINISHING AND POLISHING.

To the Editor of THE METAL INDUSTRY:

I have read over and carefully considered every detail of Mr. Hellthaler's article on "Silver Finishing and Polishing," published in your September issue, and it seems to me correct and a good plain write-up on the process. Of course it applies to the finishing of highly polished work, of which there is a great amount on the market. But from a purely aesthetic and artistic standpoint we designers have tried to educate the public as to the proper way their silverware should be finished in order to bring out the truly beautiful color of the metal. This is not done by grinding out every mark of the craftsman's tool and then polishing to the brightness of a mirror; it is rather to preserve the soft mellow tone of the metal, brightening here and there to bring out the character and detail of the design.

Another great advantage of this method is durability; the metal remains free from tarnish longer, thus saving cleaning and also wear, as one can never renew a highly polished surface, once dull, without sending it back to the machines. However, don't accept this in a spirit of criticism as the greater number of people seem daft on polished work, and the article is all right as applied to everyday work wares.

September 28, 1908. A. F. SAUNDERS.

GUN METAL FINISH.

To the Editor of THE METAL INDUSTRY:

While experimenting I stumbled on the following method of putting a durable gun metal finish on steel, which to the best of my knowledge is new and may probably prove to be of value.

Take the steel article and clean in the usual manner; then give it a light flash in the cyanide copper bath, and heat it red hot. Allow it to cool and color with the emery cake on stitched buff. It is next to impossible to cut through the blue produced in this way. In the above the copper deposit must be very light.

Saginaw, Mich. EDW. Y. GEHRLS.

CLEANING NICKEL ANODES. DON'T DO IT.

To the Editor of THE METAL INDUSTRY:

I have read with much interest the articles in your paper on the advisability of scrubbing nickel anodes.

I was brought up and religiously taught that this work was absolutely necessary to produce satisfactory results; and many is the pound of good nickel at 50 cents per I have scrubbed away, to the great pleasure and benefit of the anode manufacturer, but to the loss of dollars to my firm, and much unnecessary labor to myself. At last, finding that results equally satisfactory could be obtained by letting my anodes alone, I now save myself many hours, and my employer money by neglecting this part of my education.

In running my tanks as advocated by B. W. Gilchrist, I can always obtain best results, and this being the case, the plater who scrubs anodes becomes an expensive luxury to his firm, and when they "get wise" to the loss he is causing them he will no doubt be an advertiser in your columns under the heading of "Situations Wanted." NATHAN EMORY.

Care Victor Typewriter Co., New York City.

To the Editor of THE METAL INDUSTRY:

The letters published in the September edition of your valued paper, in answer to my article as to the advisability of scrubbing nickel anodes, show the great diversity of opinion among platers on this important question.

That Mr. Percy S. Brown takes me to task, for "the off-hand manner with which the subject is treated," is undoubtedly deserved, and in replying to the points he mentions I will now try to be more concise.

Mr. Brown says I should have made a distinction between rolled and cast anodes. I did not because there is so small a demand for rolled anodes in plating plants to-day that they are not even carried in stock by the large supply houses of New York City; and one of their salesmen told me only yesterday he had not had an order for a rolled anode in five years, and they were as out of date as a New York horse car.

That I had advanced Mr. Hawkins' idea of local battery action was a surprise to me, as one of the best known platers in the East (Mr. George L. Rice), was acting on that theory, away back in the good old bicycle days, when with unscrubbed anodes he plated the Humber wheel, the best plated wheel on the market, and I doubt if any better work is done to-day.

Mr. Brown says to clean my anodes twice a week and my tubs twice a month; but I cannot take his advice, because my work, being satisfactory to my employers now, they would ask why I had put on the three additional men to clean my 2,500 anodes twice each week (as I have that many in actual use), and why I had also put on two extra hands to clean my 24 tanks of 1,100 gallons each, and thus increased my expenses over $150 a month, to

get my solutions in such shape that no two were alike. As the nickel deposited is figured to 5/100 of a gram it would be an utter impossibility.

Dr. George Langbein (in his admirable book) advocates the plan suggested by Mr. Brown, of placing rolled and cast anodes in the same vat, but unlike him, he says, of the ammonia sulphate solution—which is the standard nickel solution of to-day—"It also requires cast anodes, since with the use of rolled anodes nickeling proceeds in a very sluggish manner." I, therefore, believe Mr. Brown should have stated the composition of his bath, as all platers know, who have tried rolled anodes in a regular solution, that they are not fit for good work.

I am heartily in accord with Mr. Brown regarding the cleaning of cathode rods, and believe they should be cleaned at least twice each day and after each load if necessary.

It may be interesting to some of your subscribers to know the results I have obtained from using anodes, as advised in my previous article.

First Test.—In a nickel-plating solution, slightly acid —2 volts—and standing 5.85 Baume, on one square foot of copper, I deposited in 2 hours 45 minutes—changing my anodes immediately after each run, anodes badly worn and not cleaned in 6 months, 4.85 grams. With the same anodes cleaned and returned to vat, all other conditions the same—4.65 grams. With new anodes from same invoice—3.25 grams.

Second Test.—In a nickel-plating solution, slightly acid of 1,100 gallons, standing between 1.75° and 1.80° Baume, with 8 volts, with very dirty anodes on an 18-inch steel blank, a deposit in 10 minutes of 0.85 grams, and after cleaning the same anodes I only deposited 0.75 grams, all other conditions being as near alike as possible.

Third Test.—In a nickel-plating solution, neutral, standing between 12° and 13° Baume, at a temperature of 130° F., tension of current, 5 volts, on a steel ribbon drawn by a motor through the solution, it took 3 minutes 45 seconds to deposit one thousandth of an inch of nickel with dirty anodes, and invariably after cleaning the anodes we had to increase the time from 20 to 30 seconds to get the necessary one thousandths of an inch deposit.

Now, Mr. Editor, if a satisfactory deposit of metal can be obtained by Mr. Emanuel Basset, Jr., who in his article agrees with me—and many others who are holding positions in large plants—is it not up to those who are spending the money of their employers by scraping their anodes and letting a large portion be thrown away, to wake up and save at least part of the time and money lost in cleaning tanks and anodes—which in my case would be reducing the output by one tank each day and a loss on my pay roll of $1,500 a year. B. W. Gilchrist.

MACHINE MOLDING.

To the Editor of The Metal Industry:

We are very glad that you called our attention to the article which appears under the title of "Machine Molding" in your September issue.

This article is not only unjust to the manufacturers of molding machines, but shows conclusively that the writer of it is not at all familiar with recent improvements along this line. We are going to call your attention to one or two erroneous statements that he makes. We might say in passing that in many cases his expressions are so ambiguous that it is difficult to get the real meaning, but we believe that in reading the article the second time we have not misinterpreted him at any point.

The article states that every machine now on the market lacks one or more of the essential details of the mechanical operation for the completed mold. There were to our knowledge four or five machines at the Toronto Exhibition which made the molds completely, ready for pouring. The Modern Machine, made by this company, does this very thing.

In considering the pouring and placing of the mold in position as an essential part of the molding machine, the author of the article is taking a peculiar position because the pouring of the mold should no more be expected from the molding machine than a complete printed sheet could be expected from a linotype machine. The making of the mold and the pouring are two separate operations, and while we have no doubt that in time there may be such a thing as an automatic foundry, it could not be expected at this time and is not a part of the present consideration. The machines which we have in mind as being a perfect type of molding machine ram the molds, roll them over and draw the patterns, all being a mechanical process and some of the power machines handle the sand as well.

The author states that a model machine "should be simple in construction and operation, and the cost of operation and maintenance should be such that the ultimate cost of finished product could be reduced. No machine on the market to-day satisfies the demand." How can such a statement be made in the face of the hundreds, yes thousands of machines that are in use every day in the foundries throughout the country? Of course, we have access only to the records of this concern, but we can point to cases where molding machines have increased the output three times what it was before and by using an unskilled laborer in place of a journeyman molder. We can show a letter from one of our customers in which he states that he is saving from 35 to 50% in the costs of his molding, by the use of our machines.

In discussing the matter of expediency of the use of machines, we admit freely that if a man is only going to make a few castings of a certain type it would be useless to buy an equipment for this purpose, in the same way that it would be for a wood-worker to buy a cross-cut saw if he were going to cut but a hundred boards. If, on the other hand, the quantity of boards that he uses runs up into the thousands then he would be justified in making the expenditure. This is a matter for personal expediency and not an argument against the actual success of the molding machine. We understand that the question is merely the development along the line of machine molding.

In that portion of his paper in which he speaks of the unification of the cope and drag, he has evidently not investigated this subject, as the machine which this firm makes has used this process entirely on its machines. If we understand correctly he intends to have the cope and drag halves of the mold made at the same time and at one operation.

There is no analogy between a molding machine and a brick-making machine, for the reason that a brick-making machine has accomplished its purpose when the brick is produced and does not have to have the delicate and perfect accuracy of a machine that turns out sand molds which must bear the strain of a quantity of heated metal and produce the castings with perfect accuracy. We can cite hundreds of cases where molding machines are producing results on a variety of work from small bench molding to large floor work, and by our own experience, which is, of course, the only one by which we should judge accurately, we know that the molding machine in brass, gray iron and malleable foundries, had paid larger returns on the investment than any device that has ever been installed.

We take issue on the closing argument in which he infers that the molding machine is not an important part of foundry development. Indeed, we believe that the molding machine bears the same importance toward foundry economy that the typesetting machine means to the modern newspaper. It is perfect folly to say that the molding machine is not a success in view of the thousands that are in daily use throughout the United States, and the developments along this line as shown at the exhibition given at the Foundrymen's Convention should be the most convincing proof of this statement.

If the above will result in an investigation by your Magazine, we believe that you will see that we have not overstated matters in any particular; in fact, by taking this subject up with any enterprising manufacturing concern they will be able to show you conclusively in their own foundry the reason why we deem it necessary to write you at such length.

ARCADE MFG. CO.,
REEVE BURTON,
Sales Dept.

Freeport, Ill.

(There is one point in your letter which we think is a misinterpretation of Mr. Hart's statement, for you will notice in the last paragraph of his article, page 275, he says: "Thus, the molding machine is but one phase of foundry development. It is an important one, to be true, but the others require attention, and as the average foundryman experiences it, what is equivalent to the selling in a business is the most important factor after all," but does not say that it "is not an important part of foundry development," as you state.—Ed.)

To the Editor of THE METAL INDUSTRY:

As to our opinion of the article by Mr. Hart on "Machine Molding," we believe it is an extremely good one. One thing that pleases the writer is the way in which Mr. Hart discusses his subject. The man who is interested in molding machinery or who intends to design molding machinery should read it as we believe it will be of great assistance to him.

THE J. D. SMITH FOUNDRY SUPPLY COMPANY.

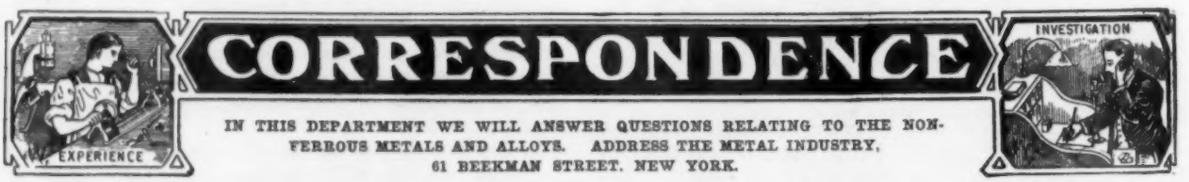
Cleveland, O.

To the Editor of THE METAL INDUSTRY:

Your letter of the 21st instant with marked copy is received, and I had already read in a previously received copy Mr. Hart's admirable article. Although just what Mr. Hart is advocating is not quite clear, I consider he has touched the Molding Machine idea from a broader basis than any one's writing I have read.

Yours very truly,
THE E. H. MUMFORD COMPANY,
E. H. MUMFORD,
President.

Philadelphia, Pa.



IN THIS DEPARTMENT WE WILL ANSWER QUESTIONS RELATING TO THE NON-FERROUS METALS AND ALLOYS. ADDRESS THE METAL INDUSTRY, 61 BEEKMAN STREET, NEW YORK.

METALLURGICAL.

Q.—In the cire perdue process how can I take a wax from a glue mold without ruining the glue mold?

A.—We would say first there is no book on the cire perdue method of molding. The process is touched upon in many works and encyclopedias, but how much real information can be obtained in that way is very uncertain. Almost every practical man has different ways of working. There is no trouble in casting the wax in the glue mold if the wax is not poured too hot. This particular temperature must be studied in a scientific and careful manner, not by feeling, but with a thermometer. Glues and gelatines differ; what might be a successful temperature with one brand is not so with another. Great care and study, making memoranda as one goes along, will bring success. J. G. N.

Q.—Be kind enough to give us a formula for phosphor bronze castings suitable for bushing in cream separator work. The shafts that run in most of the bushings run from 8,000 to 12,000 revolutions per minute.

A.—The standard phosphor bronze for bushings is composed of copper 78, tin 11, lead 10 and phosphorus 1. If, instead of using phosphor bronze for your castings, you made them from plastic bronze, broaching to size and then tinning lightly you would get a better bushing. This alloy is unexcelled for wear and the broaching gives a hard mirror-like surface, while the tinning allows the shaft to get a good seat without heating up.—J. L. J.

Q.—Will you kindly tell us whether silicon-copper is being used in place of phosphor-tin in copper-tin alloys, and also whether it is apt to cause excessive shrinkage in castings, especially in heavy castings weighing from 1,000 to 1,500 pounds?

A.—Silicon-copper is used to some extent in brass and bronze mixtures, but as it is a very brittle alloy it reduces strength and toughness to a marked degree if used in other than very small amounts. All deoxidizers which make dense, close-grained castings increase the shrinkage of the metal and require heavy gates and risers. Silicon itself has a very high melting point and silicon-copper cannot give as fluid a metal as phosphorous. Silicon-copper isuesd in mixtures for electrical work in preference to phosphorous as it does not reduce the electrical conductivity so much.—J. L. J.

Q.—I am having trouble casting tuyeres. I am using a mixture of 98 scrap copper and 2 zinc, although I do not adhere strictly to this proportion. The tuyeres are 5/16 inch thick on the sides and ⅝ inch top and bottom. In cooling, the outside wall cracks. I have tried different cores, but without solving the trouble.

A.—A very successful maker of tuyeres uses a mixture of 99½ pounds good ingot copper and ½ pound 10 per cent. silicon-copper. The copper is melted quick and hot and the silicon-copper added just before pouring. If scrap copper is used it may be necessary to use more silicon-copper. The use of scrap copper is not open to objection if it is good, heavy material, but light wire, etc., oxidizes and gives a metal that is liable to crack. The

fact that your castings come spongy and crack, shows that the 2 pounds of zinc used does not thoroughly deoxidize the copper.—J. L. J.

Q.—I would like to cast candle-holders, busts and things in the statuary line.

A.—In producing castings from molds three compositions are used. Upon statuary work the mixture is 99 parts of bertha spelter and 1 part antimony. For many varieties of silver-plated goods, where extreme lightness is required, brittannia metal is employed consisting of

Tin	93
Antimony	5
Copper	2

For novelty work such as small clocks, candle-holders and a number of such articles black metal is used, also know as antimonious lead. This is composed of lead 100 pounds and Cookson's or Hallet's antimony 13 to 15 pounds, according to the hardness desired.—C. P.

Q.—One of our customers to whom we sell is anxious to get some information on the matter of melting and casting zinc into molds made of iron.

A.—When zinc castings are made at a high temperature they are brittle and crystalline. When cast near the melting point of the zinc they are comparatively tough. The molds should be heated and provided with large gates. An ounce of aluminum added to each 100 pounds of zinc will brighten the castings. A pure spelter like the Illinois will give tougher castings than the grades that are full of dross.—J. L. J.

Q.—Is there anything that can be added to zinc in the shape of a chemical or other material that will stop it from shrinkage? We are well aware that the added mixture of tin, copper and aluminum will make good castings in iron molds, but we want to use pure spelter.

A.—The excessive shrinking of zinc is one of its inherent qualities and no chemical can be added that will prevent this shrinkage. The shrinkage may be reduced by pouring at a low temperature or casting under pressure. Where it is not possible to make castings in one piece the patterns may be divided and the castings soldered together subsequently.—J. L. J.

Q.—I wish to inquire if it is possible to mold aluminum so that the surface will be very smooth in order that it may be japanned and give a firm, smooth coat free from pinholes, without first being ground and filled. We are at present using molds without any facing and find the castings are somewhat rough and full of small pinholes.

A.—We understand that some of the makers of aluminum castings are using a facing on their molds just as is done by ironmolders on stove covers, oven plates, etc., and obtaining very smooth castings. Pinholes are due to pouring the metal too hot. Never overheat aluminum and do not pour hotter than a cherry red. The addition of a little zinc has a tendency to prevent pinholes.—J. L. J.

Q.—We would like you to define the word "spilly" as applied to brass, copper and other metals. I saw the word used in your paper and have also seen it used in various articles on brass.

A.—The term "spilliness" is applied to the imperfections in castings of brass, copper, etc., that are cast in metal molds and which result in slivers when the metal is drawn. "Spilly" castings may be due to a variety of causes—splashing the metal in pouring, impurities that cause imperfect cohesion, dross, dirt from the sides of the mold, particles of charcoal, or any coating material that may be used on the molds.—J. L. J.

MECHANICAL

Q.—In the part "Correspondence" of your valued paper we see that you answer questions free of charge. Will you kindly furnish us with the date and numbers of any United States patents relating to tandem continuous wire drawing machines. Also will you be good enough to publish your opinion which highest speeds of finishing blocks can be used to greatest advantage in order to manufacture most economically finished wire of non-ferrous metals in all sizes from the rolled rod down, stating the various alloys of metals. We mean only continuous wire drawing machines of any description.

A.—The tandem patents are as follows:

April 23rd, 1901	No. 672,568;
April 14th, 1903	No. 725,472;
June 30th, 1903	No. 732,370.

The speed for drawing copper wire from ¼" to No. 8 should be about 350′ per minute. From No. 9 to No. 14 about 700′ per minute. Finer than No. 14 about 1000′ per minute. Some of the mills run somewhat higher than this, but as a general rule the various sizes are drawn pretty close to those figures. Brass wire is drawn at about two-thirds of the speed of copper. Steel wire varies according to the carbon and temper of the wire, but as a general rule coarser sizes of steel wire are drawn at about 350 to 400′ per minute. The various mills have different mixtures for both high and low brass.—J. H. O'D.

Q.—I am sending you a rough steel bell. I would like to know what kind of emery and what kind of polishing wheels are used to get a good surface for plating?

A.—For preparing a surface upon steel such as the sample bell mentioned, Nos. 70 and 100 emery are used, the first for roughing and the second for finishing. Canvas or Spanish felt wheels are used, the size of which should be not less than 12 inches in diameter, with a 1½ or 2 inch face. The wheels are coated with a good grade of glue to which is added, while hot, a little dry white lead and wood alcohol, which gives a good adhering glue for the purpose. When the wheels have been coated with the glue they are turned in the emery until evenly coated. In the finishing it is customary to fine down the emery with a good flint stone and then apply a little tallow and again apply the stone; this imparts a smooth surface upon the face of the wheels for finishing. The wheels should dry at least 24 hours before using.—C. P.

CHEMICAL

Q.—We are manufacturers of silver-plated hollowware, of which the base metal is britannia. In the preparation of the surface of this metal for plating it frequently occurs that black stains are developed, which dipping the work in potash or even dipping it in electric cleaning compound does not remove. The manner in which we are at present removing these stains is by scouring with brushes on a lathe or spindle. This is very tedious and unsatisfactory.

A.—It is customary for some concerns to use a very dilute solution of muriatic acid for this purpose, usually a 3 to 5 per cent. solution. This dissolves the oxide of

tin if it is not too dense, without impairing the surface of the article.—C. P.

Q.—I should like you to give a good "brightener" for brass plating. I am using the arsenic brightener, which I don't care for as it goes off color too quick.

A.—Commercial sulphate of ammonia, such as is used in nickel plating, makes a very good brightener for brass baths. Use two or three ounces to the gallon; or you may add 2 or 3 pounds of bisulphite of soda to a 100-gallon bath and then add about a quart of ammonia. With care it is not necessary to add arsenic to a brass solution.—C. P.

Q.—I would like the best and cheapest way of finishing grates in brush brass and old brass.

A.—If the grates are brass plated then the best method for you to pursue would be to use a steel scratch brush about 6 inches in diameter and 4 rows wide. This should be made of crimped wire about 36 gage. Run at a speed 1,000 or 1,200. Use a flint stone to soften up the wires by pressing against the brush when running. Make up a mixtrue of equal parts of rotten stone and pulverized pumice stone, and a little lard oil. Apply a little to the work and brush lightly all over; this will give you a good dead finish. Afterward wash in benzine or gasoline; dry out in maple sawdust and lacquer with a good body lacquer. The old brass is produced in the same manner, but it is customary to have a black background. After the articles are lacquered and dry apply dead black Jap-a-lac thinned with a little turpentine. Allow to dry for 10 minutes, then relieve the high lights with rags moistened with equal parts of boiled linseed oil and turpentine. This will not affect the lacquer. When dry this gives a beautiful antique or old brass effect.—C. P.

Q.—I would like a formula for a brown bronze solution.

A.—If the articles are of brass or bronze, polish and cleanse in the usual manner, then immerse in a cold solution of sulphuret of potassium, 2 to 3 ounces to the gallon. This will give dark variegated colors. Remove, wash, pass through strong muriatic acid, wash again and pass through hot water; finally scratch brush wet, using a little sal soda in the water. This will give you a light brown color. Wash and reimmerse as before, but use a more dilute acid solution; wash and dry out in sawdust, and scratch brush dry. This will give you a Barbedienne bronze. Upon brass-plated goods the finish is somewhat darker, but with care good results can be obtained.—C. P.

Q.—We want an old brass finish. We have been turning out a brush or scratch finish and one of our customers says "scratch" fitly describes it. We want a finish that will not show the brush marks as ours does.

A.—There are two methods whereby you may avoid the scratch effect in brush brass finish. The first is to use a brass scratch brush made up from the finest crimped wire obtainable, 4 or 5 inches in diameter, and at least 4 rows wide. This should be run at not more than 1,200 revolutions per minute. Cut down your brass in the regular way; cleanse it, then go over it with the brass brush to which apply a little powdered pumice stone with water. Go over the articles lightly with a circular motion and a fine dead surface will be produced free from scratches. It is advisable to keep a little water dripping upon the wheel and 1 or 2 ounces of sal soda should be added to each gallon of water to keep it soft. After brushing, the articles are washed, passed through the cyanide dip, dried out and lacquered. The above is the wet method. The second method is to use a steel wire brush of about the same or a little larger dimensions, but the wire must be of the same fineness and of the crimped variety. Run at a speed of not more than 1,000 to 1,200. For the polishing medium use equal parts of rotten stone mixed up with lard oil to a paste. Apply very little of this to the brush or articles and then go over lightly, giving a circular motion to the articles. Wash the adhering grease from the articles with benzine, dry out in fine maple sawdust and lacquer in the regular manner. —C. P.

Q.—Can you give me a good formula for producing a bright green on sand blasted brass? When the article is finished and the high lights relieved, the back ground is to be a bright green. I have a dip composed of equal parts of nitrate of iron and hyposulphite of soda, but it is not perfectly satisfactory.

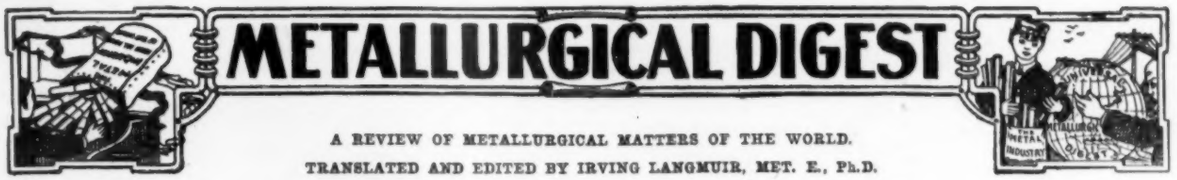
A.—To produce a good bright green take 1 pound each of sal ammoniac and sulphate of copper and dissolve in 1 gallon of boiling water. Dip the cleansed articles in this and allow to dry without washing. Then take a little of the same solution and stipple the surface with a painter's sash brush, and allow to dry again. Afterward wash in clear cold water and allow to dry. This will give you a good green. Lacquer with a transparent lacquer. A green can also be produced by immersing the articles in a hot solution of sulphate of copper 8 ounces to the gallon; this has more the appearance of an oxide. Another method for a green oxide is to immerse the articles in a nearly boiling solution consisting of

Nickel salts	½ lb.
Hyposulphite of soda	½ "
Water	1 gal.

After washing immerse the articles in clean boiling water for a few minutes; a good color should result.—C. P.

Q.—(1) Will a brass solution work best hot or cold? (2) Why use carbonate of soda in a brass solution? (3) Is it best to use copper, brass, or copper and zinc anodes in brass? (4) If I dissolve cyanide in water and add copper it turns blue and banks up; is that correct? (5) Is it practical to plate heavy iron chains such as are used on chandelier work in a roto-plater?

A.—(1) A brass solution gives the best and most uniform deposit at about 80 degrees. (2) Carbonate of soda is added as a conducting salt in the same manner as sulphate of ammonia is added to a nickel bath, to decrease the internal resistance of the bath. (3) Copper anodes give the best results. Maintain the brass color by slight additions of zinc dissolved in ammonia water and just sufficient cyanide added to clear the solution. One quart of such a mixture will change a 250-gallon bath when producing a reddish deposit to a good yellow brass. (4) It is always best to dissolve the cyanide in cold water when adding the carbonate of copper, mix with the copper 1 ounce of bisulphite of soda to each 4 ounces. You will find the copper dissolves easier and produces a clearer solution. When a cyanide solution of brass or copper becomes blue it shows an excess of copper. (5) It is practical to plate chain in a rotoplater. A good deposit should be obtained and then pass rapidly through a bright acid dip.—C. P.



A REVIEW OF METALLURGICAL MATTERS OF THE WORLD.
TRANSLATED AND EDITED BY IRVING LANGMUIR, MET. E., Ph.D.

ELECTRIC CONDUCTIVITY OF ALLOYS.

Dr. W. Guertler has arrived at some interesting conclusions in a paper, entitled "The Technological Significance of Our Present Knowledge upon the Electric Conductivity of Alloys," which is published in *Die Metallurgie* (1908, p. 292).

The principal constituents of the alloys which may possibly be used as electrical resistances, must, for practical reasons, be included among the following: copper, iron, nickel, magnesium, aluminum, zinc, tin, lead, antimony, bismuth and for scientific instruments, silver, gold and platinum. With these metals may be used small quantities of almost any of the known metals or metalloids.

The author has shown that the metals iron, nickel, copper, silver, gold and platinum, which all have comparatively high melting points, are characterized by their property of forming solid solutions with nearly all other elements (metals and such non-metals as carbon, silicon and phosphorus) when these latter are present in small quantity. In all such alloys the conductivity is enormously sensitive to the presence of these added metals, in each case the conductivity being much deceased even by the addition of a small fraction of a per cent. of any other metal. As the amount of the impurity increases the conductivity decreases but more and more slowly until finally when the saturation limit of the solid solution is reached, the conductivity becomes practically constant. It so happens, however, that those substances which are capable of being taken up to the smallest extent in the form of solid solutions, are just the ones which have the greatest effect in reducing the conductivity. The result is that in every case these alloys have a much lower conductivity than the pure metals. There is still the theoretical possibility that some compounds of the above-mentioned six metals may have a higher conductivity than the pure metals, but the results of all investigations have shown that these metals do not form compounds with each other.

On the other hand, if we attempt to find alloys with a high resistance, but with other desirable properties, such as a negligible temperature coefficient for the resistance, the possibilities at first sight appear practically infinite. It is shown, however, that in the great majority of cases the temperature coefficient is decreased along with the conductivity and to an extent nearly proportionate to it. Only in exceptional cases where the alloy appears to be in some relatively unstable condition is it possible to obtain an alloy with moderately high conductivity and negligible temperature coefficient. There seem to be great possibilities in this field in the way of producing such alloys. The author points out that all the commercially successful resistance metals or alloys are composed primarily of one or more of the six difficult fusible metals given above. A consideration of the remaining more easily fusible metals, magnesium, zinc, aluminum, tin, antimony, lead and bismuth shows that they exhibit almost no tendency to form solid solutions, but, on the other hand, easily form chemical compounds. Corresponding to the absence of solid solutions, the conductivity of alloys of these metals is not much lower than would be calculated by the simple rules of proportion from the conductivities of the constituents. The compounds formed between these metals are found to be always brittle, rendering them useless for industrial purposes. Besides, their conductivity is found to be invariably lower than that of at least one of its constituents; while the temperature coefficient is approximately the same as in pure metals. There is thus seen to be no hope of producing alloys from these easily fusible metals which will have either high conductivity or low temperature coefficient.

The author then considers alloys containing both groups of metals.

His final conclusions may be summarized in the following rules:

1. It is a hopeless task to attempt to find new electrical conductors which will have a resistance equal to or exceeding that of copper and silver. The only practical problem in this line is to find what elements can be alloyed with copper to give it the most valuable physical properties while lowering its conductivity as little as possible.

2. Alloys with negligibly small temperature coefficients must consist principally of difficultly fusible metals, such as copper, iron, nickel, and, for special purposes, silver, gold and platinum. Additions of small quantities of other elements may be used in these alloys.

Russia produces annually copper of a value of about 25 million rubles ($12,800,000) although under favorable conditions the production would easily reach 40 million rubles. Finished copper is produced in only six plants manufacturing sheet copper and tubes. The Russian copper is unsuited for tubes, so that the industry is barely able to survive the competition of foreign countries, especially that of Germany.

REPORTS OF THE PROCEEDINGS OF THE METAL TRADES ORGANIZATIONS.

AMERICAN BRASS FOUNDERS' ASSOCIATION.

American Brass Founders' Association.—President Charles J. Caley, New Britain, Conn.; secretary, W. M. Corse, 54 Lathrop avenue, Detroit, Mich.; treasurer, John H. Sheeler, Philadelphia, Pa. The object of the association is purely educational, and is accomplished by the collection of such information as will be of benefit to the members and to general shop practice, by the presentation of papers on appropriate subjects, and by the publication of such literature.

Secretary Corse reports that the efforts of the society during the past month have been directed to securing the prompt payment of dues that the cost of preparing the printed transactions may be taken care of more readily. The secretary has recently issued a circular setting forth the objects of the association and advantages of membership. We herewith print the paragraph relating to "Membership."

MEMBERSHIP.

"The annual dues, payable on notification of election, are $5.00. This covers the total cost of membership and gives the member the privilege of attending all meetings, taking part in the business of the Association and discussing the papers presented. It also gives him the right to view the exhibits of the Supply Association, and to take part in the entertainment features, free of cost.

"We are especially desirous of obtaining as members those concerns or individuals who feel that the next few years will witness rapid progress in the scientific end of the metal business and who are ready and willing to help such a movement

along. Scientific men are especially welcome, for it is only when harmony exists between theory and practice that real results are achieved. If interested in any way in the subject of metals you will find it to your advantage to join the American Brass Founders' Association."

INSTITUTE OF METALS.

FORTHCOMING CONFERENCE IN BIRMINGHAM.

Considerable progress has been made in the development of the Institute of Metals, and arrangements are now practically completed for the first conference, which is to take place in Birmingham on November 11 and 12. The Institute, it will be remembered, originated in March last at a meeting held in Manchester of copper and brass manufacturers, engineers and others. The idea was to do for metals the kind of work already done for iron by the Iron and Steel Institute. The Institute was formally launched in June at a London meeting presided over by Sir William White, who was made the first president, Professor Carpenter and W. H. Johnson were elected joint honorary secretaries, with Professor Turner, M. Sc., of Birmingham, as honorary treasurer. The headquarters are to be in London with permanent secretary and offices, but meetings are to take place at various provincial centres, and a journal will be published with original papers and abstracts of current literature.

G. Shaw Scott, M. Sc., has been appointed permanent secretary and has a temporary location at Bournbrook University, Birmingham, where he is acting with a local committee, of which Mr. Baeddicker (of Henry Wiggins & Co., Ltd.) is chairman, and Councillor G. P. Poppleton is honorary secretary. The committee at a recent meeting prepared their provisional conference programme. The meetings will take place at the Technical School, Suffolk street, on the mornings of November 11 and 12. Sir William White will deliver his presidential address, which will be followed by papers from Dr. Glazebrooke, Mr. Rosenhain, A. M. M. Philip, Dr. Hodgkinson, Mr. Robertson and others. A visit will be paid in the afternoon to the Bournbrook University, and an evening conversazione under the auspices of Councillor Kenrick, who will then be Lord Mayor. The second afternoon will be spent in visits to works of interest in the Birmingham district.

The number of members continues to increase, and it is hoped, in view of the approaching Birmingham meeting, that all gentlemen interested in or connected with metal trades will forward applications for membership to the secretaries, so that they can attend it.

The London offices of the Institute will probably be in the vicinity of the Institution of Mechanical Engineers. A subcommittee have this matter in hand, and it is expected that by the end of November the London office will be opened.

THE PERMANENT SECRETARY.

G. Shaw Scott, M. Sc., of Sutton, Coldfield, Birmingham, is a native of Walsall, where he was born 24 years ago. After some years at Queen Mary's School, Walsall, he entered the University of Birmingham in 1902, where first as an undergraduate and subsequently as a graduate he took an active interest in the affairs of the institution. At the University he held the offices of Chairman of the Metallurgical Society, Chairman of the Engineering Society and President of the Guild of Undergraduates, in addition to various secretaryships. He took his B. Sc. degree, together with the Bowen Research Scholarship in Metallurgy in 1906, and devoted his final year at Birmingham to a research on case-hardening, the results of which, read subsequently before the Iron and Steel Institute, obtained for him in July 1907 the M. Sc. degree. Mr. Shaw Scott is particularly interested in the metallurgical side of motor engineering, and has made many contributions to technical literature on this and other metallurgical subjects. He has also contributed numerous articles to the *Engineering Journal* of his University, and to the general press. He has traveled considerably for educational purposes, having visited Russia, Sweden, West Africa, Canada, United States, France, Germany, Denmark, West Indies, etc. During the past twelve months he has been engaged in commercial and practical engineering and metallurgical work in the Midlands.

ASSOCIATED PLATING FOREMEN.

Chas. H. Proctor and C. S. Barbour, Jr., are at present taking considerable interest in the formation of a Platers' Society which shall be established on similar lines to the Association of the International Steam Engineers, the organization to be composed of foremen and expert platers. Messrs. Proctor and Barbour believe there is room for such a society independent of all other associations. Some individuals who have taken an interest in the formation of such a society are J. French, plater for Herman Strater & Sons, 7 Sudbury street, Boston, Mass., and Messrs. Brennan & Critchley, who are jewelry and electro-platers of Providence, R. I. There has been no organized effort made as yet to form such a society, but the parties mentioned are doing some missionary work towards that end.

INDUSTRIAL CHEMISTS AND CHEMICAL ENGINEERS.

An important step in the development of engineering chemistry in this country was taken at the recent New Haven meeting of the American Chemical Society by the organization of a Division of Industrial Chemists and Chemical Engineers. Arthur D. Little, of Boston, was elected chairman of the division and vice-president of the society, and indicated in his address the broad field awaiting development by the new organization.

The division will include a large proportion of the membership of the society and especially those engineering chemists whose work is directly concerned with industrial development and progress. The division will begin the publication at an early day of *The Journal of Industrial and Engineering Chemistry*, for which a strong board of editors was elected.

ITEMS OF INTEREST TO THE INDIVIDUAL.

FERDINAND DEMING AND HIS WORK.

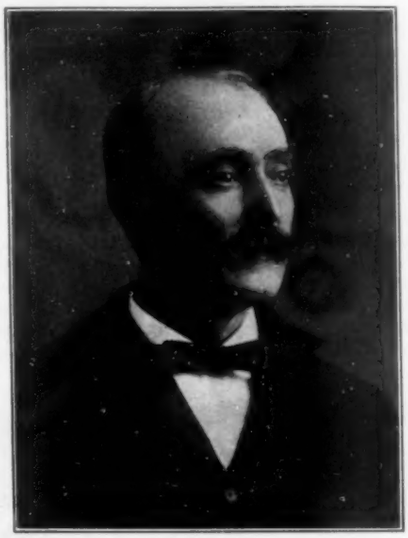
About every rolling mill in the land which has ever had trouble with its machinery will recognize the subject of this sketch—Ferdinand Deming—The Master Rolling Mill Mechanic. We believe that most rolling mills will recognize him at a glance, for it is customary to send for him when the mill's machinery goes wrong.

Ferdinand Deming was born 50 years ago at Litchfield, Pa. His parents were from Woodbury, Conn., a town not far from South Britain. When a boy Mr. Deming worked on a farm and went to school at Woodbury, Middlebury and Waterbury, Conn., and when through school started as an apprentice in the machine shop of C. W. Johnson. Mr. Johnson was a skilled mechanic and inventor and helped the brass and copper industry of Waterbury considerably by his inventions. It was at this shop that Mr. Deming secured his first knowledge of practical shop practice and from the Johnson shop he went into the service of the Waterbury Farrell Foundry & Machine Company, working there a number of years. From the Waterbury Farrell shop he went to the rolling mill of Randolph and Clowes, also of Waterbury, where he stayed nine years.

It was while at Randolph and Clowes that Mr. Deming developed the tube business of that concern, drawing the seamless brass tubes shown in the engraving. These tubes were 24 inches in diameter and said to be the largest ever drawn. Mr. Deming worked out the draw benches and machinery required for drawing these big tubes. While there he also drew torpedo tubes conical in shape and 15 feet long, and did considerable work in designing and developing machinery for cutting and drawing up metal goods. He would take a five-foot blank and draw it into tubes. The next rolling mill that Mr. Deming was with was the Rome Tube Works, of Rome, N. Y., where he installed the ma-

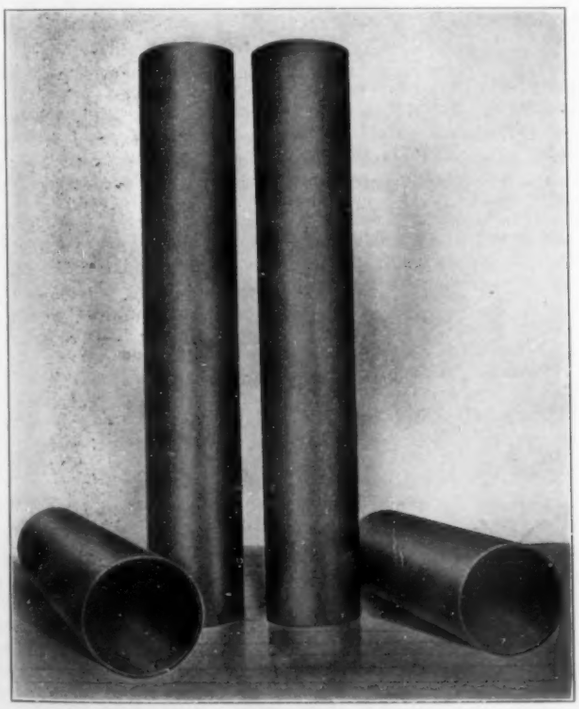
chinery and saw that the mill was running successfully and it has been successful ever since.

In 1891 and 1893 we find Mr. Deming in Spain making cartridges for the Fabrica Nacional Trubia, situated in the town



FERDINAND DEMING.

of Asturios, which is near the foothills of the Pyrenees Mountains. Though he could not speak a word of Spanish when he went there, and as no one in the arsenal could speak English except the commandante, by the time that Mr. Deming quit Spain



SEAMLESS BRASS TUBES 24 INS. IN DIAMETER, DRAWN BY FERDINAND DEMING, AT THE WORKS OF RANDOLPH AND CLOWES, WATERBURY, CONN.

he had the Dons manufacturing cartridges American fashion. On coming home again he went to Toronto, Canada, and installed the machinery at the Canada Brass Rolling Mill and made the plant ready to produce metal. He then returned to the States and among his recent work has been to get the new Michigan Copper and Brass Rolling Mills of Detroit running in good shape, then the new Buffalo Copper and Brass Rolling Mills. When he is not busy getting other mills out of trouble Mr. Deming is engaged in equipping a tube mill of his own and his associates for the manufacture of small-sized tubing. His interesting descriptions of his mill and traveling experiences, and his thorough knowledge of mechanical problems, makes him a very attractive companion.

WILLIAM MALCOLM CORSE.

William Malcolm Corse, the popular secretary of the American Brass Founders' Association, will, on November 1, become assistant manager of the Michigan Smelting & Refining Company, Ltd., of Detroit, Mich., and will have full charge of the works. It is Mr. Corse's intention to have one of the most completely equipped chemical laboratories in the country to handle alloy work. The company's business is the manufacture of brass ingot metal, solder and white metals to specification.

We herewith print a brief sketch of Mr. Corse, who is very active in promoting the educational welfare of the metal industry.

Mr. Corse is a native of Massachusetts, and a graduate of the Medford High School and the Massachusetts Institute of Technology in the department of chemistry. After graduation he spent several years in the manufacturing end of the pharmaceutical and the paint business. In 1903 he went with the Detroit Lubricator Company as chemist and until recently held the position of assistant superintendent with that concern, being in charge of their brass foundry and chemical laboratory. Besides his position as secretary of the American Brass Founders' Association, he is a member of the American Chemical Society, president of the Society of Detroit Chemists, and president of the Detroit Foundrymen's Association. He is very optimistic about the future of the Brass Association and believes that the coming year will be one of profit to the Association on account of the publications which will be issued in connection with the American Foundrymen's Association. The steady increase in membership also indicates that the interest in the movement is growing at a very gratifying rate.

Frank H. Taylor has resigned as vice-president of the Yale & Towne Manufacturing Company, of Stamford, Conn. Mr. Taylor's plans for the future are not yet settled, but he believes that competent managers will be needed in the near future as business recovers. At present he is giving his attention to his own affairs. Mr. Taylor at one time was second vice-president of the Westinghouse Electric & Manufacturing Company.

Harry D. Harvey has resigned his position as vice-president of the National Supply & Metal Company, of Baltimore, Md., and is now giving all of his attention to looking after the affairs of the Monarch Engineering & Manufacturing Company, which builds the "Steele-Harvey" metal melting furnaces. J. Wilcox has taken Mr. Harvey's place with the National Supply & Metal Company, who are manufacturers of railway bearings and plumbers' goods.

E. G. Acheson, the well-known inventor of Carborundum and other electric furnace products, reports that some time ago he did quite a little work regarding the carbon-siloxicon crucibles, but that he has not had time to carry forward the matter beyond the laboratory stage.

At the meeting of the directors of the various constituent companies of the American Hardware Corporation, held on October 3, Howard S. Hart resigned as president and director of the Russell & Erwin Manufacturing Company, as director of the Corbin Screw Corporation, and as second vice-president and director of the American Hardware Corporation. He thus severs connections with the American Hardware Corporation, except as president of the Corbin Motor Vehicle Corporation. B. A. Hawley succeeds Mr. Hart as president of the Russell & Erwin Manufacturing Company. I. D. Russell was elected vice-president, and R. R. Leeds assistant secretary. The vacancy on the board of directors of the Corbin Screw Corporation was not filled. C. H. Parsons was elected second vice-president of the American Hardware Corporation, and the vacancy on the board of directors was not filled. W. J. Surre, prior to the meeting of the board of directors, resigned as secretary of the Corbin Screw Corporation, and the vacancy was filled by the election of Geo. P. Spear.

Royal F. Clark has accepted a position with M. C. Lilley & Company, of Columbus, O., as foreman electro-plater.

George Kutzen, who has been in charge of the polishing and plating department of the Cushman & Denison Manufacturing Company, 240 West Twenty-third street, New York City, for the past two years, has returned to his home in Detroit on account of ill health.

George T. Smith, vice-president of the Joseph Dixon Crucible Company, was elected director of the National Association of Stationers and Manufacturers during the recent convention held in Chicago.

John M. Ready, manager of the New York branch of the Joseph Dixon Crucible Company, has returned from a trip to Europe, accompanied by his mother and sister.

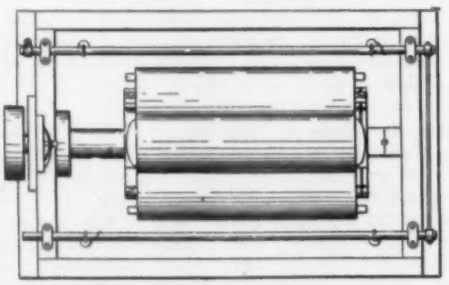
DEATHS.

George G. Blackwell, founder of Geo. G. Blackwell, Sons & Co., Limited, of Liverpool, England, died at his residence, Waterloo, England, on August 26, 1908. Mr. Blackwell founded the firm in 1869. The nature of the business was the production of metallurgical products, alloys and fluxes.

PATENTS

REVIEW OF CURRENT PATENTS OF INTEREST TO THE READERS OF THE METAL INDUSTRY.

892,417. July 7, 1908. PLATING MACHINE. Charles Glover, New Britain, Conn. The objects of this invention are—to provide an improved construction for plating machines, including improvements in a carrier adapted to move certain conveyors

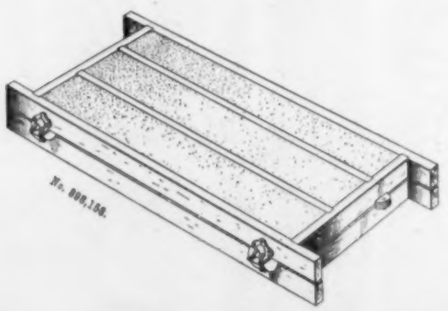


through the plating solution, which conveyers may be readily detached at will for the substitution of new articles to be plated. The construction will be understood from the accompanying plan view.

896,400. August 18, 1908. BLACKLEADING MACHINE. Frank J. Learman, of Buffalo, N. Y. In matrix coating machines, as commonly used in electroplating work, the wax matrix is placed in a bath of finely pulverized plumbago, commonly called "black lead," and water. A suitable pump is employed for forcing the liquid through a movable discharge spout against the surface of the matrix in the bath to coat the same with the black lead, and this pump preferably takes the liquid from the bath so as to keep the same liquid in circulation. The object of this invention is to provide an actuating mechanism for the movable discharging spout which will be simple in construction and positive in operation and which will automatically move the discharge spout back and forth in different directions, or universally over the matrix so that the entire surface will be completely and evenly coated with the black lead.

896,632. August 18, 1908. PROCESS OF HARDENING COPPER. Henry Vonphul Draper, Springfield, Mo. The method of employing this process is as follows: The copper is first melted and pulverized alum and arsenic are added in the proportions of 1 pound of alum and 4 ounces of arsenic to every 20 pounds of copper. The alum and arsenic are thoroughly mixed before introducing them into the furnace. The melted mass is thoroughly stirred and then poured into the molds. It is stated the resulting metal is of great density, toughness and hardness. The mixture may be melted as often as desired without losing any of its characteristics.

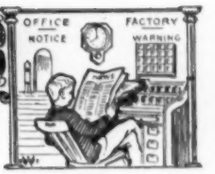
898,158. September 8, 1908. HINGED MATCH-PLATE FOR FLASKS. Lee W. Van Cleave and George O. Dewey, assignors to the Buck's Stove & Range Company, of St. Louis, Mo. The main object of this invention is to provide a match-plate which is connected to one member of a flask in such a manner that a workman can remove it by merely swinging it upwardly, thus permitting large



match-plates to be used. Another object is to provide a hinge composed of two members that are adapted to be connected to the cope and drag of a flask and an intermediate member that is adapted to be connected to a match-plate which is arranged between the cope and drag. This co-operating hinge is so constructed that the cope can be swung upwardly and removed and the match-plate can thereafter be swung upwardly and lifted out of the hinge member of the drag.

897,179. August 25, 1908. METAL-CUTTING SHEARS. Charles E. Weeks, Prosperity, Mo. This machine is particularly designed for cutting sheet metal without distorting, buckling, or crimping that portion of the metal cut from the sheet. Another object is to provide means whereby the length of the cut produced by the shears can be regulated so that the shears can cut any desired distance into the sheet.

TRADE NEWS



TRADE NEWS OF INTEREST DESIRED FROM ALL OF OUR READERS. ADDRESS THE METAL INDUSTRY, 61 BEEKMAN STREET, NEW YORK.

Two exceptional opportunities to rent factories in Brooklyn, N. Y., are described in our "Trade Wants" page.

"We sell yellow-brass ingot. We buy yellow-brass trimmings," is the announcement of Whipple & Choate, Bridgeport, Conn.

W. F. Polson, a manufacturer of wind shields and auto accessories, of Buffalo, N. Y., is installing a brass foundry of his own.

The Hiller Manufacturing Company, of Rochester, N. Y., have gone into the manufacturing of brass bedsteads and costumers.

The Walker & Pratt Foundry, of Watertown, Mass, is feeling the effects of improved business conditions, and the entire force is now working full time.

The Lunkenheimer Company, of Cincinnati, O., one of the largest brass manufacturers in the country, have placed every department of its great plant on full time.

The Jamestown Metal Furniture Company, of Jamestown, N. Y., are erecting a new factory. A switch has been installed by the Erie Railroad which will greatly facilitate the work of building.

W. W. Blaney & Co., solder and metal, smelters and refiners of drosses at No. 6 Northampton street, Boston, Mass., have gone out of business. The proprietor, W. W. Blaney, however, is still interested in reading about metals.

The Zucker & Levett & Loeb Company make the announcement in their advertisement that any folded buff not stamped with their trade mark "Triplex," used or sold is an infringement on their license patents and their rights in this respect will be strictly enforced.

The I. S. Spenser's Sons, of Guilford, Conn., makers of brass and gray iron castings, are having plans drawn for an extensive addition which will include a new up-to-date plating plant, thereby increasing their facilities for finishing work many times their present capacity.

The Ohnstrand Metal Furniture Company has changed its name to the Jamestown Metal Furniture Company, with executive offices and factory at Jamestown, N. J. They are manufacturers of artistic equipments for public buildings, banks, offices and libraries in steel and bronze.

The J. W. Paxson Company of Philadelphia, Pa., during the past month sent out invitation cards to all of their patrons asking them to be present at their pier Thursday afternoon, October 8, 1908, to witness the river display in connection with Philadelphia Founders' Week.

The Blake & Johnson Manufacturing Company, of Waterbury, Conn., makers of brass and iron hardware, had had plans drawn for a factory at Waterville, Conn. The structure will be one story high, with basement, 200 x 260 feet. An office building and power plant will be erected later.

The Roesch & Glueck Plating Company have opened for business at 903 South Church street, Belville, Ill., where they will do all kinds of plating. Both members of the firm have had long and varied experience in the business. They expect to make stove plating a specialty.

The Hewitt Manufacturing Company, of St. Louis, Mo., has been granted a permit to remodel the old plant of the Hoyt Metal Company, at a cost of $30,000. It is expected the work will be completed about the middle of December. The company manufacture railroad brass goods.

The World Aluminum Company, of Elgin, Ill., having outgrown its present quarters, expects to put up a new building. The company will go into the gas stove business. The present output consists of aluminum cast ware, cooking utensils, house numbers, harness rings, fixtures, etc.

The business in aluminum, brass, and bronze castings formerly carried on by the MacFarland Company is now being handled by L. W. MacFarland, 277 Broadway, New York, in association with the Edward J. Blake foundry at Hartford, Conn. Castings for the automobile trade are the firm's specialty.

It is reported that the General Galvanizing Company, of Warren, Pa., has a new process of electro-galvanizing. Mr. Guido Sagerdote, of 44 East Twenty-first street, New York City, now has an option on the company's stock and is endeavoring to form a company to promote the process owned by the firm.

The Standard Bronze & Brass Company, of Columbus, O., have opened offices and foundry at 187 West Broad street. The company will engage in the brass, bronze, aluminum and copper casting business and are prepared to execute orders in large quantities. They will also make manganese bronze castings.

The Charter Oak Stove and Range Company, 1440 North Main street, St. Louis, Mo., who have recently taken out a patent for snap flask bands and flask hinges, have not decided as yet what they will do with their invention. It is their present intention not to market the flasks themselves, but to sell the patent outright or on a royalty basis, or they will manufacture for some sales company.

The Leonard-Baker Stove Company, of Taunton, Mass, which was incorporated some time ago with a capital of $10,000, has about completed the building operations and is now ready for business. The foundry department measures 40 by 60 feet and the rest of the building 50 by 100 feet. The officers of the company are: Louis L. Lincoln, president; Eugene L. Baker, vice-president, and Chester N. Leonard, treasurer.

The brass and iron foundry business started at Stonington, Conn., by A. B. Miller some 50 years ago has grown from time to time until the buildings now occupy more than half an acre of ground. The business is known as A. B. Miller's Sons, the sole owner and manager being Charles W. Miller. The concern recently cast a 1,600-pound boat shoe and closed a contract for two tons of brass spikes for a schooner now on the stocks.

The American Metal Coating Company, 92 Murray street, New York, is prepared to sherardize all sorts of small articles, such as bolts, nuts, screws, etc. Some of the gentlemen connected with this concern were among the first in this country to investigate this new method of coating which is now attracting so much attention. Sherardizing is particularly valuable for use on threaded articles, as the diameter of the thread is not increased by the coating and the screws do not have to be re-cut.

The Brady Brass Company, 95 Liberty street, New York City, reports an increased demand for its products, including several bookings during the past two weeks for new equipment. T. M. May has been engaged as a representative of the company. Mr. May is a graduate of Oxford, Eng., and is well known throughout the railway trade. John W. Gannon, graduate of Yale,

afterward Engineer Maintenance of Way of the Atlanta & West Point Railroad, has also entered the service of the company.

The Damarra Manufacturing Company, 32 Broadway, New York, make bronzing lacquers, varnishes, and rust and heat proof paints suitable for coating all kinds of metals. These materials are said to be especially effective in protecting metal work exposed to the weather, and being low-priced they can be used to advantage even on large objects. They have been in successful use for some time on locomotive boiler heads, coin-slot machines, cannons, projectiles, and have been put to various other similar uses.

The Ideal Furnace Company, Scottdale, Pa., is the title of a new firm of furnace builders. They manufacture the "Ideal" Tilting Furnace, and the company is composed of P. J. Sweeney, president, formerly of the Rockwell Engineering Company, and W. J. Holzapfel, secretary and treasurer, foundry superintendent of the Crescent Manufacturing Company. Mr. Holzapfel is the patentee of the furnace and patents have been issued in the United States and Canada and have been applied for in Great Britain, Germany, France and Belgium.

Work has begun on the new sheet copper mill of C. G. Hussey & Company, of Pittsburg, Pa., and it is expected to have everything running in about sixty days. The new structure will be a two-story brick building and will contain a 24 x 72-inch rolling mill built by the A. Garrison Foundry Company, of Pittsburg. This will give the company additional capacity in its nail and stamping departments. Their manufactures include sheet copper and copper specialties such as copper gaskets, nails, tacks, special shapes, both sheared and stamped.

John Hassall, Inc., 183 Lafayette street, New York, the well-known manufacturer of rivets, escutcheon pins and special wire nails in brass, copper, German silver, and all other metals, has recently installed a complete plant for brass, copper and nickel plating, tinning, electro galvanizing, and for bluing small steel articles of all kinds. In addition to their regular work this firm will accept orders from outside concerns for work in any of the above-mentioned lines, and invites those in the market to submit samples for an estimate of cost on finishing same.

Ernest A. Lewis, of 310 Dudley road, Birmingham, England, one of the leading metallurgists of Great Britain, announces that he undertakes the weighing and sampling of all kinds of ores and residues in any part of England and Wales and would be glad to hear from American firms exporting metals, ores and residues. He is also open for consulting work in all branches of the copper and brass industry at moderate terms, and invites correspondence from American and Canadian firms. Mr. Lewis gives these parts of his business his personal attention.

The J. D. Smith Foundry Supply Company, of Cleveland, Ohio, report that they have installed recently complete brass furnace settings for the Rickersberg Brass Company, the Comstock Brass Company, the Standard Smelting & Refining Company and the American Brass Manufacturing Company of Cleveland. The core oven of the company which was in operation at the Toronto convention has been installed in the plant of the Ideal Bronze Company of Cleveland. The Winton Motor Car Company has just installed a second Cleveland aluminum melting furnace.

On another page we call the attention of our readers to the plating supplies and equipment of W. Canning & Company, 133 Great Hampton street, Birmingham, England. This firm is 200 years old, having supplied the noted silversmiths of Elkington & Company, of Birmingham, with the first platers' supplies they used. W. Canning & Company have since grown until they now employ 350 hands in their four different works. They are engaged in the manufacture of machinery, electrical apparatus, chemicals and supplies. Besides standard goods the firm manufacture a number of specialties which are of interest to American, Canadian and British consumers.

L. G. Delamothe, the flower metallizer, reports that the rumor is not correct that he has resigned from the Delamothe Natural Art Decorating Company, Incorporated, referred to as the "Flower Metallizing Company" of Spokane, Wash. Mr. Delamothe says he has no idea of resigning from the company and that it has an exclusive product which has every indication of a marked success. The output within a short time will reach 5,000 rose hat pins per day, and there is, Mr. Delamothe says, an unlimited market for them. Their factory is the largest of the kind in the United States and they expect to increase their capacity again within the next few months. Their factory at present has 11,000 square feet of floor space.

Nickel platers who desire to secure real English nickel salts can obtain same from Fuerst Bros. & Company, 2 Stone street, New York. This firm is sole agent for The Mond Nickel Company, Ltd., England, and the salts have been analyzed by Stillwell & Gladding, official chemists, New York Produce Exchange, with the following results:

	Nickel Ammonium Sulphate: (Double Salt.)	Nickel Sulphate: (Single Salt.)
Nickel	15.00%	21.05%
Arsenic	None	None
Iron	Trace	Trace
Insoluble Matter	None	Trace

Fuerst Bros. & Company also supply antimony, magnesium, cadmium, caustic potash and many other metals, alloys and chemicals.

Wahle-Phillips Company, 549-551 West Fifty-second street, New York, have one of the most complete plants in existence for the manufacture of high grade lighting fixtures. The company was organized early in 1908 and has met with gratifying success. At the present time the plant is very busy. It is being run with a full force at practically its full capacity. The company manufactures special fixtures for high class buildings of all kinds. They have equipped many important buildings, including the following: Massachusetts Mutual Life Insurance Company, Springfield, Mass.; Academy of Music, Brooklyn, N. Y.; Gaiety Theatre, New York; Baltimore Hotel, Kansas City; First National Bank, Albany, N. Y.; Glens Falls Trust Company, Glens Falls, N. Y.; Universalist Church, Rochester, N. Y.; Church of Reconciliation, Utica, N. Y.; B'Nai Jehudah Temple, Kansas City; Masonic Temple, Rome, N. Y.; German Theatre, New York; court houses, post offices and residences in various cities. They also furnished the fixtures for the new boat "Americana," built by the Buffalo Dry Dock Company.

FIRES

The rebuilding of the Loranna Foundry, of Norristown, Pa., which was recently destroyed by fire, has been completed and is progressing rapidly, all the foundation work having been completed. The company will produce gray iron and brass castings.

The Union Metal Works, of Chelsea, Mass., which recently suffered by fire, will immediately rebuild their machine shop and foundry and expect to have the plant in running order by the first of the coming month. The company are manufacturers of brass and copper goods.

The plant of the Monarch Brass Works, employing 65 men, at St. Catherines, Ontario, Canada, was destroyed by fire on September 16. The loss of plant and stock was $75,000; insurance $52,500. The company report that they will rebuild at once in Toronto, Canada, where their main office is located.

FINANCIAL

The Wolverine Brass Works, of Grand Rapids, Mich., have increased their capital from $225,000 to $400,000; the increase will be used in a general increasing and enlarging of the business. The officers are: L. A. Cornelius, president, and H. C. Cornelius, secretary and treasurer.

The Colonial Steel Company, of Pittsburg, Pa., at its annual meeting recently, authorized the increase of its capital stock to $2,000,000, a gain of $750,000. This action was taken partly for

the purpose of developing their new product which they call "composite metal," which is copper or brass of any thickness welded to steel. The idea is to manufacture steel sheets of ordinary thickness and weld them to thin sheets of copper, thus obtaining the strength of the steel and the protecting or non-corrosive qualities of copper. The company will ultimately increase the size of the plant in order to take care of this branch of the business.

The New York Metal Selling Company has declared an initial dividend of 10 per cent. on its capital stock. At the suggestion of the directors the shareholders voted at their annual meeting to increase the outstanding capital stock from $50,000 to $100,000. M. E. Appelbaum, A. G. Kays and I. M. Hays were elected directors to succeed Henry Sonn and Hyman Sonn. Mr. Appelbaum also was elected president and treasurer, being chosen to fill the latter office to succeed Henry Sonn, and I. M. Hays was selected vice-president to succeed Hyman Sonn. The corporation was formed for the purpose of marketing copper, tin and lead. It is reported that it is now selling about 30,000,000 pounds of copper a year.

INCORPORATIONS

In addressing newly formed corporations it is advisable to include the names of the incorporators.

THE ONTARIO BRASS ROLLING MILLS, LIMITED, of Toronto, Canada, has been incorporated with a capital of $200,000 by John Franklin Brown, William Richard Travers and James Joseph Walsh.

THE POPE AUTOMATIC MERCHANDIZING COMPANY, of Chicago, Ill., has been incorporated with a capital of $50,000 to manufacture and deal in automatic vending machines. The incorporators are: Clarence R. Pope, George H. Scott and Joseph H. Billmeyer.

THE CURTIN-HERBERT MANUFACTURING COMPANY, of Gloversville, N. Y., have been incorporated with a capital of $100,000, thus merging the two largest machine shops in Fulton County, the Curtin-Herbert Manufacturing Company and the Anthony Machine Shop.

DORSETT-DEMARRAIS COMPANY, of Hoboken, N. J., have been incorporated with a capital of $20,000 to manufacture tinners' sheet metal specialties, general sheet metal work, etc. The incorporators are Timothy W. Dorsett, Albert Villaret and Joseph A. DeMarrais.

THE DUNDEE BRASS MANUFACTURING COMPANY, of Dundee, N. Y., has filed incorporation papers with the Secretary of State, the paid-in capital being $8,000. The permanent organization was formed for the purpose of making plans for building and purchasing a suitable site.

THE J. D. BERGEN COMPANY, of Meriden, Conn., has been incorporated with a capital of $60,000. It is probable the cut-glass department will be moved from Meriden to Chicago and the local factory devoted exclusively to the manufacture of brass goods. The president of the company is Walter H. Bradley.

THE MACFARLANE BROTHERS' MANUFACTURING COMPANY, of Bridgeport, Conn., have filed a certificate of incorporation. The concern has a capital of $50,000 and is authorized to manufacture silver and plated ware. The incorporators, all of Bridgeport, are Francis H. Macfarlane, T. E. Macfarlane and G. R. Burnes.

PRINTED MATTER

THE MANUFACTURING CHUCK, fitted for operation by compressed air, is fully illustrated in a pamphlet issued by W. L. Abate, 76 West Lincoln avenue, Mt. Vernon, N. Y. This chuck can be operated by hand lever or air pressure, at the will of the operator. It is very rapid in its action, and possesses a number of distinctive features not found in any other chuck.

"GRAPHITE," the monthly publication issued by the Joseph Dixon Crucible Company, of Jersey City, N. J., comes to us this month full of good things, among which we find "Where Crucibles are Made," "Preventing Corrosion of Steam Machinery," views of the new Wanamaker store, Philadelphia, "Paint Specifications for Steel and Iron," "Prolonging the Life of Crucibles," etc.

DUPLEX WINDOW VENTILATOR. We have received from the Virginia Metal Manufacturing Company, of Portsmouth, Va., a circular descriptive of their ventilating apparatus for residences, offices, store windows, etc. This ventilator is made in any kind of metal and in any finish. The company also make the Virginia automatic fire closing roof ventilator and are general metal work contractors.

PATENTS, TRADE MARKS, DESIGNS, COPYRIGHTS. This is the title of a neat pamphlet issued by Langdon Moore, Washington Loan and Trust Building, Washington, D. C. The pamphlet describes in brief and concise form the development of the patent system of the United States, also patents, trade marks, designs, copyrights, prints and labels, ceveats, preliminaries examinations, assignments, interferences, oppositions and cancellations, appeals and other phases of patent law which are of interest to inventors and patentees.

FIRE BRICKS. Bulletin No. 1 from the Baltimore Retort & Fire Brick Company, of Baltimore, Md., shows many of their standard and special shapes of fire brick. The location of this plant, with the best shipping facilities, both rail and water, enables them to obtain all the varieties of fire clay required in the manufacture of their wide line of material, in the most economical manner. The Bulletins issued by the company contain cuts and descriptions of their regular and special shapes, also tables, rules, etc., of value to users of fire brick.

FOUNDRY SUPPLIES AND EQUIPMENT. A special catalogue has been received from the S. Obermayer Company, of Cincinnati, O., Chicago, Ill., and Pittsburg, Pa., covering everything required for the complete installation of brass, bronze and aluminum foundries, and special outfits for experimental purposes. Among the materials mentioned are: Crucibles, foundry flasks, brass founders' drying stoves, molders' tools, riddles, sifting machines, sprue cutters, core ovens, magnetic separators, core machines, rumbling barrels, melting furnaces and foundry supplies.

"BASSITE" is an alloy designed to take the place of tin in the manufacture of brass castings. It is claimed to save the brass founder fully 33 per cent. of the usual outlay for tin, and from 10 to 30 per cent. upon the cost of finishing castings. Just exactly what it will do is mentioned in a pamphlet by the manufacturers, the Bassite Mining & Smelting Company, of Cincinnati, Ohio. The pamphlet also gives valuable formulas for the use of "Bassite" in the making of ordinary steam and water goods; for hard copper castings, for soft copper castings; for lathe and engine bearings; for trolley wheels; gun metal, etc.

CONSULTING CHEMIST. Frederick J. Maywald, F.C.S., Consulting Chemist, who succeeded the late Dr. Peter F. Austin, 89 Pine street, New York, is distributing a pamphlet entitled "Get Ready for Prosperity," in which he calls attention to the advantage to manufacturers of establishing a set of standards for the purchase of all their raw materials and equipment, and to the advisability of having their manufacturing processes investigated by experts, with a view to reducing costs, improving the product, utilizing by-products, etc. The services of Dr. Maywald and his staff are available for special purposes or for regular supervision at a yearly or monthly charge.

EMERY AND CORUNDUM WHEELS. We have received from the American Emery Wheel Works, of Providence, R. I., a large catalogue dealing with their emery and corundum wheels and specialties. The emery and corundum wheels made by the vitreous process are subjected to an intense heat of nearly 3,000 degrees F. As inferior materials cannot withstand this high temperature, it is impossible to use any but the very purest emery and corundum. The wheels are not pressed or tamped, and con-

sequently are even in texture, porous and open, making them extremely rapid and cool cutting. The method of manufacture followed by this company makes it impossible for these wheels to contain hard or soft spots. They are not affected by weather, time, water, oils or other liquids, and can be used for wet or dry grinding.

PROTECTION OF IRON AND STEEL FROM CORROSION. We have received from the Meaker Company, of 44-50 Elizabeth street, Chicago, Ill., a valuable pamphlet dealing with this subject. Their process consists of an indestructible solution of high conductivity which is not only from 20 to 100 per cent. more rapid than any now in use, but also deposits a thicker coating of zinc, and when used with the company's apparatus its economical features are increased. No matter how you may now be galvanizing, the company guarantees to effect substantial saving both in labor and operation, or charge nothing for the trial. The Meaker Electrolytic Solution is the product of 10 years of experience in electro-galvanizing work. It plates directly from zinc anodes and requires no attention whatever beyond an occasional addition of water to replace that lost by evaporation. The color of the coating obtained is a beautiful glossy white—it does not finger-mark readily and stays bright longer when subjected to the influence of the weather than that produced by any other process. The solution and apparatus are offered for sale outright, there being no royalty charges of any description.

ROCKWELL CRUCIBLE MELTING FURNACE. The W. S. Rockwell Company, 50 Church street, New York City, have issued a very neat pamphlet describing their new crucible melting furnace for copper, brass, bronze, aluminum, silver, gold, nickel, iron, steel, etc., and adapted for either oil or gas. This crucible is stated to be superior to all others because the loss of metal by oxidation is very low; the life of the crucible is very long, and the cost for oil or gas is less than for coal or coke. In the furnace the area of metal exposed is small, and the combustion is complete and clean, the heat clear and strong and well suited to rapid melting without burning. As the flame is directed toward the bottom of the furnace the bottom of the crucible is always hot, and as the flame rises around the crucible it hugs it on all sides and fills the space beneath the cover to protect the metal on top. The cover need not be lifted to pour and the metal is not exposed. The crucibles are very much the same as the standard except that they are higher. They are made so because less area of metal in proportion to weight is exposed to oxidation and because it is just as easy to run a deep fire with oil or gas fuel. As no tongs are used they have less bilge. The crucibles are made in four sizes, having capacities of 200, 400, 800 and 1,600 pounds.

DAILY METAL PRICES

We have made arrangements with the New York Metal Exchange by which we can furnish our readers with the Official Daily Metal Market Reports of the Exchange and a year's subscription to THE METAL INDUSTRY for the sum of $10. The price of the Report alone is $10. Sample copies furnished for the asking. We can also furnish daily telegraphic reports of metal prices.

METAL MARKET REVIEW

October 12, 1908.

COPPER.—The London market for standard copper fluctuated very slightly, opening at £60 12s. 6d., and closing at £59 17s. 6d.; the small decline for the month was due mostly to the decline in the stock market and the lower quotations sent out from the New York Metal Exchange.

The New York market for copper has ruled dull and easier during the month, until towards the close, when there was a rather firmer tone to the market. There is no disposition to buy on the part of consumers and there have been small lots of spot copper offering at below the quoted rates without finding buyers; with any kind of a demand these outside lots would soon disappear, and possibly higher prices would prevail. Statistically the market is not in good shape; we are producing considerably more than we can consume or export and the foreign stocks of copper are heavier than they have been in years. The only point in favor of the holders of these stocks is the easy rates for money both here and abroad. The exports for the month, 19,378 tons, against 17,157 tons same month last year. The total exports for the nine months of this year show an increase of 99,092 tons over the same period last yaer. The market to-day is more or less nominal. Lake, 13½ to 13⅝; Electrolytic, 13.40 to 13.50; Casting brands, 13¼ to 13⅜.

TIN.—The London tin speculators were able to advance the price of tin about £3 per ton during the month and this in the face of bearish statistics and dull trade in America. The New York market advanced about ¾ cent per pound during the month. The consumption is estimated at 2,300 tons against 2,600 tons in August. The total visible supply of tin is quite heavy, being 18,100 tons against 17,257 a month ago. The market closes at around 29.50 for spot and October delivery; futures are 5 to 10 points higher.

LEAD.—The foreign lead market is about the same as a month ago, closing at £13 5s.

The New York lead market has been dull and a shade easier; prices at the close are about 7½ points lower; business has been very dull.

The Trust reduced their price to 4½ New York.

SPELTER.—The London market has been rather firmer and prices at the close are about 10s. higher.

The New York market has ruled dull and easier and prices have declined from the early advance, and close at about 4.75 New York carload lots. Prompt shipment from the West.

ANTIMONY.—The foreign market has advanced about £2 per ton during the month, but the market has ruled dull and quiet, and closes a shade lower than a month ago. Cooksons 8.00 cents; Halletts, 7.80; other grades, 7.50.

ALUMINUM.—The aluminum company has announced a reduction in ingots, the price now standing at 29 cents for 99 per cent. pure, and a reduction of 4 cents has been made in the price of sheets, bringing the base price down to 36 cents.

PLATINUM.—The market for platinum has been dull and easier and prices to-day are about $1.00 per ounce lower. The indications are that these prices will not hold for long and that higher prices may be looked for. We quote ordinary at $21.00; hard at $23.50, and scrap at $15.00.

SILVER.—The London silver market has ruled very steady and shows an advance for the month of about ¼d. per ounce. In New York the price is about ½-cent higher, closing at 51⅝c.

SHEET METALS.—There has been no change in the official price of sheet copper, copper wire or brass sheets, but the price of sheet copper can be shaded considerably from the quoted list price.

OLD METALS.—The old metal market has been dull and inclined to be easier; the larger dealers are inclined to hold on to their stocks of heavy copper and copper wire and prices are about the same as last month.

QUICKSILVER.—The London price for quicksilver has been advanced 5s. per flask to £8 10s., and the New York price for wholesale lots has been advanced to $46.00 per flask and for smaller lots to $47.00 per flask.

THE SEPTEMBER MOVEMENTS IN METAL

	Highest.	Lowest.	Average.
COPPER—			
Lake	14.00	13.35	13.60
Electrolytic	13.80	13.30	13.50
Casting	13.50	13.20	13.25
TIN	29.55	28.50	28.90
LEAD	4.60	4.50	4.55
SPELTER	4.75	4.75	4.75
ANTIMONY (Halletts)	8.00	8.00	8.00

Metal Prices, October 12, 1908

NEW METALS.

	Price per lb.
COPPER—PIG, BAR AND INGOT AND OLD COPPER. Duty Free. Manufactured 2½c. per lb.	
Lake, car load lots	$13.65
Electrolytic, car load lots	13.55
Castings, car load lots	13.50
TIN—Duty Free.	
Straits of Malacca, car load lots	29.50
LEAD—Duty Pigs, Bars and Old, 2⅛c. per lb.; pipe and sheets, 2½c. per lb.	
Pig lead, car load lots	4.50
SPELTER—Duty 1½c. per lb.	
Western, car load lots	4.75
ALUMINUM—Duty Crude, 8c. per lb. Plates, sheets, bars and rods, 13c. per lb.	
Small lots	33.00
100 lb. lots	30.00
Ton lots	29.00
ANTIMONY—Duty ¾c. per lb.	
Cookson's cask lots, nominal	8.00
Hallett's, cask lots	7.75
Other cask lots	7.40 to 7.50
NICKEL—Duty, 6c. per lb.	
Shot, Plaquettes, Ingots, Blocks, according to quantity	.45 to .60
MANGANESE—Duty 20%	.80
MAGNESIUM—Duty free	1.30
BISMUTH—Duty free	1.80
CADMIUM—Duty free	1.40
	Price per oz.
GOLD—Duty free	$20.67
SILVER—Duty free	.51⅝
PLATINUM—Duty free	20.00
QUICKSILVER—Duty 7c. per lb. Price per pound	65c. to 66c.

OLD METALS.

	Price per lb.	
Heavy Cut Copper	11.50	12.00
Copper Wire	11.00	11.75
Light Copper	10.00	10.50
Heavy Mach. Comp.	10.50	11.00
Heavy Brass	8.00	9.00
Light Brass	6.00	6.50
No. 1 Yellow Brass Turnings	7.50	8.00
No. 1 Comp. Turnings	8.50	9.00
Heavy Lead	4.00	4.20
Zinc Scrap	3.00	3.50
Scrap Aluminum, turnings	6.50	7.00
Scrap Aluminum, cast, alloyed	15.00	18.00
Scrap Aluminum, sheet (new)	20.00	21.00
Old Nickel, solid	19.00	23.00
No. 1 Pewter	18.00	19.00

INGOT METALS.

	Price per lb.
Silicon Copper ..... according to quantity	28 to 30
Phosphor Copper, 5% ..... " "	19 to 21
Phosphor Copper, 10% to 15% Guaranteed ..... " "	28 to 30
Phosphor Tin ..... " "	34 to 36
Brass Ingot, Yellow ..... " "	10 to 11
Brass Ingot, Red ..... " "	12 to 14
Bronze Ingot ..... " "	11 to 13
Manganese Bronze ..... " "	14 to 17
Phosphor Bronze ..... " "	13 to 16
Casting Aluminum Alloys ..... " "	29 to 35

PHOSPHOROUS—Duty 18c. per lb.
According to quantity ..... 32 to 40

PRICES OF HOT ROLLED SHEET COPPER.

SIZES OF SHEETS.		64 oz. and over 50 lb. sheet 30 x 60 and heavier.	32 oz. to 64 oz. 25 to 50 lbs. sheet 30 x 60.	24 oz. to 32 oz. 18¾ to 25 lb. sheet 30 x 60.	16 oz. to 24 oz. 12½ to 18¾ lb. sheet 30 x 60.	14 oz. and 15 oz. 11 to 12½ lb. sheet 30 x 60.	12 oz. and 13 oz. 9⅜ to 11 lb. sheet 30 x 60.	10 oz. and 11 oz. 7⅞ to 9⅜ lb. sheet 30 x 60.	8 oz. and 9 oz. 6¼ to 7⅞ lb. sheet 30 x 60.	Lighter than 8 oz.
		CENTS PER POUND.								
Not wider than 30 ins.	Not longer than 72 inches.	18	18	18	18	19	20	21	24	27
	Longer than 72 inches. Not longer than 96 inches.	18	18	18	18	19	21	24	27	
	Longer than 96 inches.	18	18	18	18	20	24			
Wider than 30 ins. but not wider than 36 inches.	Not longer than 72 inches.	18	18	18	18	20	22	25	28	
	Longer than 72 inches. Not longer than 96 inches.	18	18	18	18	20	24	27		
	Longer than 96 inches. Not longer than 120 inches.	18	18	18	19	21				
	Longer than 120 inches.	18	18	19	20					
Wider than 36 ins. but not wider than 48 inches.	Not longer than 72 inches.	18	18	19	20	22	25	28		
	Longer than 72 inches. Not longer than 96 inches.	18	18	19	21	23	26			
	Longer than 96 inches. Not longer than 120 inches.	18	18	20	22	26				
	Longer than 120 inches.	18	19	21	24					
Wider than 48 ins. but not wider than 60 inches.	Not longer than 72 inches.	18	18	19	21	24	29			
	Longer than 72 inches. Not longer than 96 inches.	18	18	20	22	27				
	Longer than 96 inches. Not longer than 120 inches.	18	19	21	24					
	Longer than 120 inches.	19	20	22	26					
Wider than 60 ins. but not wider than 72 ins.	Not longer than 96 inches.	18	19	21	26					
	Longer than 96 inches. Not longer than 120 inches.	18	20	23	28					
	Longer than 120 inches.	19	21	26						
Wider than 72 ins. but not wider than 108 ins.	Not longer than 96 inches.	19	21	24						
	Longer than 96 inches. Not longer than 120 inches.	20	22	25						
	Longer than 120 inches.	21	23	27						
Wider than 108 ins.	Not longer than 132 inches.	22	24							
	Longer than 132 inches	23	26							

Rolled Round Copper, ⅝ inch diameter or over 18 cents per pound. (Cold Drawn, Square and Special Shapes, extra.)

Circles, Segments and Pattern Sheets three (3) cents per pound advance over prices of Sheet Copper required to cut them from.

All Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, one (1) cent per pound over the foregoing prices.

All Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, two (2) cents per pound over the foregoing prices.

Cold Rolled and Annealed Copper, Sheets and Circles, take the same price as Cold or Hard Rolled Copper of corresponding dimensions and thickness.

All Polished Copper, 20 inches wide and under, one (1) cent per pound advance over the price for Cold Rolled Copper.

All Polished Copper, over 20 inches wide, two (2) cents per pound advance over the price for Cold Rolled Copper.

Planished Copper, one (1) cent per pound more than Polished Copper.

Cold Rolled Copper prepared suitable for polishing, same prices and extras as Polished Copper.

Tinning Sheets, on one side, 3½c. per square foot.

For tinning both sides, double the above price.

For tinning the edge of sheets, one or both sides, price shall be the same as for tinning all of one side of the specified sheet.

COPPER BOTTOMS, PITS AND FLATS.

14 oz. to square foot and heavier, per lb.	22c.
12 oz. and up to 14 oz. to square foot, per lb.	23c.
10 oz. and up to 12 oz.	25c.
Lighter than 10 oz.	28c.

Circles less than 8 in. dia., 2c. per lb. additional.
Circles over 13 in. dia. are not classed as Copper Bottoms
Polished Copper Bottoms and Flats, 1c. per lb. extra.

ZINC—Duty, sheet, 2c. per lb.	Price per lb.
Mill price, carload lots	7.00 less 8%
Open casks	6.50

Metal Prices, October 12, 1908

PRICES ON BRASS MATERIAL—MILL SHIPMENTS.

In effect Aug. 10, 1908, and until further notice.

To customers who purchase less than 40,000 lbs. per year and over 5,000 lbs. per year.

	Net base per lb. High Brass.	Low Brass.	Bronze.
Sheet	$0.14¼	$0.16½	$0.18½
Wire	.14½	.16¾	.18¾
Rod	.14½	.16¾	.19¼
Brazed tubing	.20¾	—	.23½
Open seam tubing	.18¾	—	.21½
Angles and channels, plain	.20¾	—	.24¼

30% discount from all extras as shown in American Brass Manufacturers' Price List No. 7.

NET EXTRAS FOR QUALITY.

Sheet—Extra spring, drawing and spinning brass..	¾c.	per lb. net advance.
" —Best spring, drawing and spinning brass....	1½c.	" " " "
Wire—Extra spring and brazing wire	¾c.	" " " "
" —Best spring and brazing wire	1c.	" " " "

To customers who purchase less than 5,000 lbs. per year.

	Net base per lb. High Brass.	Low Brass.	Bronze.
Sheet	$0.15¼	$0.17½	$0.19½
Wire	.15½	.17¾	.19¾
Rod	.15½	.17¾	.20¾
Brazed tubing	.21¾	—	.24½
Open seam tubing	.19¾	—	.22½
Angles and channels, plain	.21¾	—	.25¾

5% discount from all extras as shown in American Brass Manufacturers' Price List No. 7.

NET EXTRAS FOR QUALITY.

Sheet—Extra spring, drawing and spinning brass..	¾c.	per lb. net advance.
" —Best spring, drawing and spinning brass....	1½c.	" " " "
Wire—Extra spring and brazing wire	¾c.	" " " "
" —Best spring and brazing wire	1c.	" " " "

BARE COPPER WIRE—CARLOAD LOTS.

14¾c. per lb. base.

SOLDERING COPPERS.

300 lbs. and over in one order	19c.	per lb. base.
100 lbs. to 300 lbs. in one order	18½c.	" " "
Less than 100 lbs. in one order	20c.	" " "

PRICES FOR SEAMLESS BRASS TUBING.

From 1¼ to 3½ in. O. D. Nos. 4 to 13 Stubs' Gauge, 18c. per lb.
Seamless Copper Tubing, 21c. per lb.

For other sizes see Manufacturers' List.

PRICES FOR SEAMLESS BRASS TUBING Iron Pipe Sizes.

Iron Pipe Size.	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6
Price per lb.	26	25	20	19	18	18	18	18	18	18	18	19	20	22	24	25

PRICE LIST OF IRON LINED TUBING—NOT POLISHED.

	Per 100 feet. Brass.	Bronze.
⅜ inch	$8	$9
½ inch	8	9
⅝ inch	10	11
¾ inch	12	13
⅞ inch	14	15
1 inch	18	20
1¼ inch	22	24
1¾ inch	25	27
1½ inch	32	35
1¾ inch	45	48
2 inch	56	60

Discount 45 and 5%.

PRICES FOR MUNTZ METAL AND TOBIN BRONZE.

Muntz or Yellow Metal Sheathing (14" x 48")	15c. lb. net base
" " " Rectangular Sheets other than Sheathing	17c. " " "
" " " Rod	16c. " " "
Tobin Bronze Rod	17c. " " "

Above are for 100 lbs. or more in one order.

PLATERS' METALS.

Platers' bars in the rough, 23½c. net.
German silver platers' bars dependent on the percentage of nickel, quantity and general character of the order.
Platers' metal, so called, is very thin metal not made by the larger mills and for which prices are quoted on application to the manufacturers.

PRICES FOR SHEET BLOCK TIN AND BRITANNIA METAL.

Not over 18 in. in width, not thinner than 23 B. S. Gauge, 4c. above price of pig tin in same quality.
Not over 35 in. in width, not thinner than 22 B. S. Gauge, 5c. above price of pig tin.

PRICE LIST FOR SHEET ALUMINUM—B. & S. Gauge.

Wider than..... and including.....	3in. 12in.	6in. 14in.	14in. 16in.	16in. 18in.	18in. 20in.	20in. 24in.	24in. 30in.	30in. 36in.	36in. 40in.
	in coils.								
No. 13 and heavier	36	36	38	38	38	38	41	41	41
" 14	36	36	38	38	38	38	41	41	41
" 15	36	36	38	38	38	38	41	41	41
" 16	36	36	38	38	38	38	41	41	41
" 17	36	36	38	38	38	38	41	41	41
" 18	36	36	38	38	38	38	41	41	41
" 19	36	36	38	38	38	38	41	42	43
" 20	36	38	38	38	38	40	43	44	46
" 21	36	40	40	40	40	42	45	46	52
" 22	36	40	40	40	42	42	45	49	53
" 23	36	40	40	40	42	42	45	51	54
" 24	36	40	42	44	44	44	47	53	56
" 25	38	41	43	45	45	45	48	55	59
" 26	38	41	44	48	48	48	53	57	63
" 27	38	42	46	50	50	51	56	60	66
" 28	38	42	48	50	51	51	58	64	69
" 29	40	43	50	52	54	54	63	69	74
" 30	40	44	52	54	58	64	72	74	79
" 31	45	49	57	60	65	73	76	79	85
" 32	47	51	59	63	71	79	86	92	97
" 33	49	53	62	67	75	86	93	102	112
" 34	52	57	64	72	80	93	105	112	122
" 35	..	67	72	82	92	102	117	127	..
" 36	..	82	92	102	117	122	137	..	..
" 37	..	106	110	131	146	161	176	..	..
" 38	..	126	141	156	171	186	206	..	..
" 39	..	146	166	186	206	226	..	..	..
" 40	..	176	206	226	246	..	..	..	..

In flat rolled sheets the above prices refer to lengths between 2 and 8 feet. Prices furnished by the manufacturers for wider and narrower sheet. All columns except the first refer to flat rolled sheet. Prices are for 50 lbs. or more at one time. Less quantities 5c. lb. extra. Charges made for boxing.

PRICE LIST OF SEAMLESS ALUMINUM TUBING.

Stubs' G.	B. & S. G.	1⅛"	1½"	1¾"	2"	2¼"	2½"	2¾"	3"	3¼"	3½"	3¾"	4"	4¼"	4½"
4 to 11	3 to 9	BASE PRICE 45 CENTS.										3	3	3	10
12	10											6	6	6	13
13	11											10	10	10	16
14	12	3	3	3	3	3	3	3	3	3	3	13	13	13	19
15	13	3	3	3	3	3	3	3	3	3	3	19	19	19	22
16	14	6	6	6	6	6	6	6	6	6	16	19	22	25	35
17	15	10	10	10	10	10	10	10	16	19	22	25	29	38	
18	16	13	13	13	13	13	13	19	22	25	29	32	32	44	
19	17	16	16	16	16	16	22	25	29	32	35	41	48	54	
20	18-19	19	19	19	19	19	22	22	25	29	35	35	41	60	60
21	20	22	22	22	22	22	..	..	..	..	..	..	..	..	..
22	21	25	25	25	25	25	..	..	..	..	..	..	..	..	..
23	22	35	35	35	41	48	..	..	..	..	..	..	..	..	..
24	23	57	60	60	63	67	..	..	..	..	..	..	..	..	..
25	24	73	76	..	..	..	..	..	..	..	..	..	..	..	..

Prices are for ten pounds or more at a time. For prices on smaller sizes send for manufacturers' list.

PRICE LIST FOR ALUMINUM ROD AND WIRE.

Diameter. B. & S. G'ge.	000 to No. 10.	No. 11.	No. 12.	No. 13.	No. 14.	No. 15.	No. 16.	No. 17.	No. 18.	No. 19.	No. 20.	No. 21.	No. 22.
Price, per lb	34	34½	34½	35	35½	36	36½	37	38	39	40	43	48

200 lbs. to 30,000 lbs., 3 cents off list; 30,000 lbs. and over, 4 cents off list.

PRICE LIST FOR GERMAN SILVER IN SHEETS AND ROLLS.

Per cent.	Price per lb.	Per cent.	Price per lb.
12	$0.52	16	$0.58
13	.53	17	.59
14	.54	18	.60
15	.55		

These prices are for sheets and rolls over 2 inches in width, to and including 8 inches in width and to No. 20, inclusive, American or Brown & Sharpe's Gauge. Prices are for 100 lbs. or more of one size and gauge in one order. Discount 50%.

GERMAN SILVER TUBING.

4	per cent.	to No.	19,	B. & S.	Gauge, inclusive	$0.60
6	"	"	19,	"	"	.70
9	"	"	19,	"	"	.85
12	"	"	19,	"	"	1.00
15	"	"	19,	"	"	1.15
16	"	"	19,	"	"	1.20
18	"	"	19,	"	"	1.30

German Silver Tubing thinner than No. 19 B. & S. Gauge add same advances as for Brazed Brass Tube.
For cutting to special lengths add same advances as for Brazed Brass Tube. Discount 40%.

PRICE OF SHEET SILVER.

Rolled sterling silver .925 fine is sold according to gauge quantity and market conditions. No fixed quotations can be given as prices range from 2c. below to 6c. above the price of bullion.
Rolled silver anodes .999 fine are quoted at 2c. above the price of bullion.

TRADE WANTS

AN EXCHANGE FOR THE WANTS OF THE METAL TRADES.

Advertisements will be inserted under this head at 40 cents per line, 3 lines one dollar, for each insertion, excepting Situations Wanted, 20 cents per line, 3 lines half a dollar. Answers sent in our care will be forwarded.

METALS, MACHINERY AND SUPPLIES FOR SALE

FOR SALE

A fully equipped JOB PLATING and HARDWARE SPECIALTY MANUFACTURING plant, in an Eastern Pennsylvania city of 100,000.

$5,000.00 job plating annually (can be doubled). A thoroughly established trade on HARDWARE SPECIALTIES in the United States and FOREIGN, at good profits.

Working full time with orders on hand.

VERY GOOD reasons for selling. January 1st, 1908, stock account showed $6,000.00; will sell for less to quick buyer. A splendid opportunity to get a good ESTABLISHED, fully EQUIPPED and MANNED business for less than cost. Address,

OPPORTUNITY, care The Metal Industry

FOR SALE

The license, good will, patterns and tools of a

NEW AND PATENTED VALVE.

A good opportunity for anyone wishing to enter the field or add to their present business.

Address N. P., care of THE METAL INDUSTRY.

FOR SALE

One No. 275 Steele-Harvey Metal Melting Furnace.

Same was built a little over a year ago, but has never been used. For further information address

STEELE-HARVEY, care THE METAL INDUSTRY

FOR SALE

TWO HILL CRUSHERS

For crushing brass ashes and skimmings, slightly used, guaranteed to be in good condition.

Address METALS,
Care THE METAL INDUSTRY, 61 Beekman Street, New York.

We have for sale a

SECOND HAND PLATING DYNAMO

on account of same being too small for our work:

One 6 volt Card Machine rated at 700 amperes, cost $350.00, new, 8 years ago **for sale at $80.00**

F. O. B. PERU, ILL.

AMERICAN NICKELOID & MFG. CO., Peru, Ill.

FOR SALE **Gutta Percha and Metals of all kinds**

WALSH'S SONS & CO., Newark, N. J.

FOR SALE—A lot of CUTTERS for cutting out spoon bowls, butter knife blades, etc. Have been used for sterling silver work. For further particulars, address O-2, care THE METAL INDUSTRY.

FOR SALE—AT A SACRIFICE, A BRICK FOUNDRY FACTORY with all of the machinery for smelting. Located at Utica, N. Y. For further information inquire of SAMUEL ELLIS, 322 Canal street, New York City.

FOR SALE—A PHOENIX PLATING DYNAMO; 6 volts, 3,000 amperes; direct connection to 33 H. P. 230 volt direct current motor; in good working condition. Address BOX W., care THE METAL INDUSTRY.

METALS, MACHINERY AND SUPPLIES FOR SALE—Cont'd

FOR SALE—LATHES and DRILL CHUCKS, Face Plate Jaws, Centering Chucks, Planer Chucks, etc. Immediate shipment guaranteed. Address LATHE CHUCK, care THE METAL INDUSTRY.

METALS, MACHINERY AND SUPPLIES WANTED

We PAY CASH for GOLD, SILVER and PLATINUM SCRAPS, SOLUTIONS and SWEEPINGS; Old Nickel Anodes, New or Old Mercury, Bismuth, Gas Mantle Dust and Chemicals, etc. EMPIRE CHEMICAL WORKS, 416 East 52d street, New York City.

CASH PAID for old precious metals and minerals in any form. Gas mantle dust, bronze powder, bismuth, platinum, mercury, nickel, etc. Address JOSEF RADNAI, 36 Fulton street, New York City.

OPPORTUNITIES

BRASS FOUNDERS

Practical information bureau, 40 years' experience with trade secrets, from the furnace to the finisher. Work in all known metals, from common brass to the secret process of tempering copper. 40 formulas, worth a thousand dollars.

PREPAID TO ANY ADDRESS ON RECEIPT OF FIVE DOLLARS.

JAMES ALLEN

2552 J Street, : : : SAN DIEGO, CAL.

FACTORY TO RENT, BROOKLYN; LOFT TO RENT—Complete Foundry in Brooklyn, including small Nickel Plating Plant, 3,600 square feet, first loft, steam heated, and 7 horse power, $1,500 a year. Additional horse power up to 50 horse power, at $35 per horse. Must be seen to be appreciated; any offer considered.

Light four sides, 38 windows, height of ceiling 12 feet; also use of two furnaces, and core oven and other machinery without extra expense. Water, three-quarters city rate; also watchman on premises; nothing like it in Brooklyn for the price. Address F., care THE METAL INDUSTRY, 61 Beekman street, New York city.

FACTORY TO RENT, BROOKLYN—INTERESTING to Western Manufacturers who would like the opportunity to open Eastern factory at small expense; would make a fine factory, stamping sheet metal goods, machine or experimental shop.

Entire building, standing alone, 20 x 50 1,500 square feet, 1,000 square feet concentrated ground floor and 500 square feet on floor above at 20 cents a square foot; $300 per year and ten horse power, $40 per horse, making $700 a year total rent; unlimited power and water; low figures; light magnificent. Near Wallabout Market, Brooklyn. Immediate occupancy. Twenty minutes from New York end of Brooklyn Bridge. Address F., care THE METAL INDUSTRY, 61 Beekman street, New York City.

Having recently received quite a number of inquiries on the prices of sheet metals (brass, aluminum, white metal, etc.), tools and supplies used by engravers and metal workers in general, I would appreciate it if you would interest some of the reliable concerns known to you and dealing with these products to favor me with their catalogues, price lists and especially with their lists of export discounts. JOSE M. MENDOZA, Filipinas Bo. 530, Aparto 1096, Lima, Peru.

WANTED—Going manufacturing concern wants to acquire rights to manufacture established metal specialties, small machinery with tools. Either under contract or on a royalty basis. Manufacturing facilities exceptional. For further particulars address O-18, care THE METAL INDUSTRY.

J. P. FANNING, Machinist, 678 Jefferson Avenue, Brooklyn, N. Y.—Maker of Moulds for Casting Solder, Babbitt Metal, Bar Lead, etc. We also manufacture small work. Write for particulars.

WANTED—Reliable parties to canvass for subscriptions to THE METAL INDUSTRY. Liberal commission. For further particulars address THE METAL INDUSTRY, 61 Beekman street, New York.

GOOD SALES, GOOD EQUIPMENT, GOOD ASSISTANTS and GOOD POSITIONS may be obtained by the insertion of a METAL INDUSTRY WANT.

INQUIRIES.

Inquiries received by THE METAL INDUSTRY for Metals, Machinery and Supplies. Further particulars may be obtained by addressing the inquiry number, care THE METAL INDUSTRY.

Inquiry No. 27.—Would like to hear from firms who manufacture metallic magnesia or alloys used in strengthening aluminum.

Inquiry No. 28.—Would like to hear from firms who buy white metal and aluminum scraps.

Inquiry No. 29.—Would like to hear from firms making oil-burners which can be installed in regular coal-burning brass furnaces.

Inquiry No. 30.—Would like to hear from firms who manufacture elevator or hoisting machinery, especially hydraulic or plunger systems.

Inquiry No. 31—We would like to correspond with firms who sell rolled plate.

Inquiry No. 32—We would like to hear from firms who can furnish us with "Amyl Acetate Collodion."

(Want Ads Continued on Next Page.)

TRADE WANTS

AN EXCHANGE FOR THE WANTS OF THE METAL TRADES.

Advertisements will be inserted under this head at 40 cents per line, 3 lines one dollar, for each insertion, excepting Situations Wanted, 20 cents per line, 3 lines half a dollar. Answers sent in our care will be forwarded.

SITUATIONS OPEN

WANTED—A man to take charge of a PLATING ROOM; a man with some mechanical ability who is a good plater on all solutions and who can handle some help. We will pay highest wages. Address O-25, care THE METAL INDUSTRY.

WANTED—A first class BRASS FOUNDRY FOREMAN capable of making a success in a foundry making BRASS VALVES and COCKS. One that can handle molding machines preferred. Factory located in western Pennsylvania. Highest wages will be paid the right party. State age and experience. Address BRASS VALVES, care THE METAL INDUSTRY.

WANTED—Practical men to do work themselves and to operate three Hill crushers, also furnaces making BRASS and COMPOSITION INGOT, and attend to machinery. Sixty miles from St. Louis. Only experienced men need apply. Address O-3, care THE METAL INDUSTRY.

WANTED—A first-class BRASS FINISHER who is capable of doing all round work. Must be sober, industrious and not afraid of work. Good wages and a permanent position to the right kind of a man. Address O-4, care THE METAL INDUSTRY.

WANTED—A first-class POLISHER and BUFFER who is capable of doing all round work. Must be a hustler and not afraid to work. Good wages and a permanent position to the right man. Address O-5, care THE METAL INDUSTRY.

WANTED—A first-class PATTERN FILER who is capable of doing all round bench work. Must be sober and a hustler. Address O-6, care THE METAL INDUSTRY.

WANTED—A man capable of designing and superintending the manufacture of high grade ELECTRIC LIGHT FIXTURES, or taking an active part in getting out ORNAMENTAL IRON WORK, also ORNAMENTAL GRILL and BANK FIXTURE work in BRASS, IRON and WIRE. We have a good sized shop with good facilities and would like to hear from a good plating man who understands this line of work. Address TEXAS, care THE METAL INDUSTRY.

WANTED—A good man to take charge of our POLISHING, PLATING and LACQUERING DEPARTMENT. Must be an up-to-date man, able to handle help to the best advantage and up to modern ways of turning out work. To such a man we would make a good offer. Address S-2, care THE METAL INDUSTRY.

WANTED—A young man who can take charge of COPPER and BRASS TUBE BENDING and BRAZING DEPARTMENT in a shop located away from New York. A permanent place assured for the right party. For further particulars address BRAZING, care THE METAL INDUSTRY.

WANTED—A PLATER who is competent, reliable and capable of handling all the ordinary solutions and color work, and one who has had experience in handling and finishing in a plating room well equipped for it. Large heavy cast architectural and grille work. One who is an expert on plating this kind of work for modern high-class public buildings. For further particulars, address O-16, care THE METAL INDUSTRY.

WANTED—A first-class NICKEL-PLATER and POLISHER to work on coffee urns. Wages $25.00 per week. Address S-1, care THE METAL INDUSTRY.

SITUATIONS WANTED

Advertisements under this head will be inserted for 20 cents per line, 3 lines for Half a Dollar.

SITUATION WANTED—By a BRASS FOUNDRY FOREMAN, 32 years old, thoroughly familiar with light duplicate and jobbing work. Experienced in mixing metals, handling power and hand molding machines, oil, gas and coke furnaces and up-to-date methods of running a foundry. Can furnish the best references from my last employer. Address O-7, care THE METAL INDUSTRY.

SITUATION WANTED—By a BRASS FOUNDRY FOREMAN. Expert on light and heavy work and have a thorough knowledge of molding machines and oil furnaces. Address O-8, care THE METAL INDUSTRY.

SITUATION WANTED—FOREMAN PLATER who understands all solutions is open for a position. Have ability to take full charge of Plating, Polishing and Lacquering Departments. Address O-9, care THE METAL INDUSTRY.

SITUATION WANTED—Have had 15 years' experience in the silver plate industry, including the soldering, polishing, sand and tripoli buffing, spinning and also have a knowledge of plating. Would like to take charge of a small plant. Address O-10, care THE METAL INDUSTRY.

SITUATION WANTED—By a FOREMAN PLATER, with 18 years' experience and best reference. Fine work preferred. Address O-11, care THE METAL INDUSTRY.

SITUATION WANTED—As SUPERINTENDENT or FOREMAN of Nickel Plating, Polishing and Buffing Departments. Address O-12, care THE METAL INDUSTRY.

SITUATION WANTED—By a first-class GOLD, SILVER, NICKEL, BRASS or COPPER and all round PLATER to take charge of large plating plant. Can give the best of references and will consider no position unless steady. Address O-13, care THE METAL INDUSTRY.

SITUATION WANTED—By a CHEMIST that can analyze non-ferrous metals and alloys and assay drosses. Address O-14, care THE METAL INDUSTRY.

SITUATION WANTED—By a FOREMAN PLATER who is an expert on NICKEL, BRASS and COPPER PLATING. Would like to secure a position with a good automobile Company or a firm that has a large NICKEL PLATING PLANT. Address O-15, care THE METAL INDUSTRY.

SITUATIONS WANTED—Cont'd.

SITUATION WANTED—By a PLATER of 18 years' experience; 12 years as FOREMAN for large concerns. Thoroughly up-to-date on all solutions, dips and finishes, including Silver Deposit, etc., and rapid methods of turning out work. Sober, reliable and industrious and can furnish the best of references. Would like to hear from firms desiring the services of a first-class man. Address O-17, care THE METAL INDUSTRY.

SITUATION WANTED—PLATER wishes position in New York or New Jersey. Steady, sober and reliable, and can do buffing and polishing. Hustler, and can furnish the best of reference, Eastern and Western. Address HUSTLER, care THE METAL INDUSTRY.

SITUATION WANTED—POLISHER and PLATER, experience on Builders' Hardware, Silverware, Novelties, Casket Hardware and Stoves. Knowledge of chemistry. Address O-24, care THE METAL INDUSTRY, 61 Beekman street, New York.

SITUATION WANTED—By a BRASS MOLDER with over 16 years' experience. Willing to go to any town or city. Can furnish the best of reference. Address S-6, care THE METAL INDUSTRY.

SITUATION WANTED—By a first-class ELECTRO-PLATER. Brass solutions a specialty, also Gold, Silver, Nickel and antique finishes. Can furnish the best of references. Address L. H., care THE METAL INDUSTRY.

SITUATION WANTED—By a first-class PLATER who wishes to change position. Expert on BRASS SOLUTIONS. Address S-3, care THE METAL INDUSTRY.

SITUATION WANTED—By a TOOL-MAKER who is thoroughly reliable, with 18 years' experience on tools for BRASS VALVES and PLUMBING GOODS. Can furnish the best of references. Address S-4, care THE METAL INDUSTRY.

SITUATION WANTED—By an expert on making ALUMINUM CASTINGS. Can make the strongest and lightest castings on the market. Address ALUMINUM, care THE METAL INDUSTRY.

SITUATION WANTED—By two DIE SINKERS wishing to make a change, together or separate. Wide experience on flat, hollow ware and jewelry, etc.; willing to go anywhere. Address J-8, care THE METAL INDUSTRY.

SITUATION WANTED—By PLATER thoroughly conversant with Bronze, Brass, Copper and Nickel Plating, their oxidizes and finishes. Can furnish best of references. Address BOX NO. 6, care THE METAL INDUSTRY.

SITUATION WANTED—By PLATER with 28 years' experience in all metals, including platinum. Should be glad to hear from firms desiring the services of a first class plater. Address BOX NO. 8, care THE METAL INDUSTRY.

SITUATION WANTED—By a PLATER who is thoroughly familiar with GOLD, SILVER and all finishes. Have had experience in deposit work. Married man, 38 years of age. Address GOLD, care THE METAL INDUSTRY.

SITUATION WANTED—Competent Chaser and Repoussée Worker. Also understands etching and general work. Not afraid to work. Address T. T. S., care THE METAL INDUSTRY.

SITUATION WANTED—By FIRST CLASS PLATER AND POLISHER. Has had 16 years' experience and had charge of men for the last 10 years. Can handle any kind of a plant, understands all finishes and can give good reference. Address O-19, care THE METAL INDUSTRY.

SITUATION WANTED—By a First Class PLATER with several years' experience. Can furnish the best of references. Address O-20, care THE METAL INDUSTRY.

SITUATION WANTED—Position as FOUNDRY FOREMAN or SUPERINTENDENT in brass. Have had twenty years' experience and can give the best of references. Do my own mixing. Address O-21, care THE METAL INDUSTRY.

SITUATION WANTED—By a PLATER on Gold, Silver, Black Nickel, Brass, Bronze and Tin. Plating Verde Green, Oxidizing. Address O-22, care THE METAL INDUSTRY.

SITUATION WANTED—By a PLATER, POLISHER AND BUFFER. First Class all around man. Expert in all solutions and finishes, silver deposit, galvana, plastic, cold galvanizing. Eighteen years' experience in Electro Metallurgy. Address O-23, care THE METAL INDUSTRY.

SITUATION WANTED—By a FOREMAN PLATER who is an expert on NOVELTIES, BUCKLES, etc. Thoroughly familiar with all solutions and capable of taking charge of help. Address BUCKLES, care THE METAL INDUSTRY.

HAVE YOU A WANT?

¶ Let it be known in the METAL INDUSTRY Wants, and you will get what you want.

¶ Our Want Ad. page is a regular exchange for supplying the immediate wants of the Metal Trade.

¶ The cost is 40 cents per line, three lines for One Dollar. Answers sent in our care will be forwarded.

METAL ROLLING MILLS.

INGOT, SHEET, ROD, WIRE AND TUBING.

HENDRICKS BROTHERS
Manufacturers of
Sheet and Bar Copper
COPPER FIREBOX PLATES
and STAYBOLTS
WIRE and BRAZIER'S RIVETS
IMPORTERS AND DEALERS IN
INGOT COPPER, BLOCK TIN,
SPELTER, LEAD, ANTIMONY
BISMUTH, NICKEL, Etc.
49 Cliff Street, NEW YORK

Established 1802 Cable Address: "Scovill"
SCOVILL MFG. CO.
WATERBURY, CONN.
THE LARGEST AND MOST FULLY EQUIPPED BRASS ROLLING MILLS AND METAL GOODS MANUFACTURING ESTABLISHMENT IN THE WORLD
Estimates for Specialties in Brass, German Silver and Aluminum furnished on application. DEPOTS:
NEW YORK: 75 Spring St. BOSTON: 170 Summer St. CHICAGO: 210 Lake St.

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General Offices, Mills and Factories.
Waterbury, Conn.
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Providence (R. I.) Store, 131 Dorrance St.
Shipments Upon Receipt of Order
From Large Stock of
SEAMLESS DRAWN BRASS AND COPPER TUBING
BRASS { SHEET ROD WIRE
COPPER { SHEET ROD WIRE
AT WATERBURY GERMAN SILVER { SHEET ROD WIRE

Non-Corrosive Finest Quality
COPPER AND YELLOW
(Muntz) Metal
Naval Brass
Naval Bronze
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Plates, Sheets, Bolts, Bars, Rods, Nails, Tacks, &c.
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NEW BEDFORD, MASS.
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C. G. HUSSEY & CO.
PITTSBURGH, PENNA.
Manufacturers of
COPPER
In Sheets, Plates, Rolls
ANODES
Tacks and Nails

Bridgeport Brass Co.
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Manufacturers of
Brass and Copper { Sheet Tubing Wire and Rods.
Metal Goods Made to Order from Sheet, Rod, Wire and Tubing

BRASS and COPPER in Sheets and Rolls
SILVER PLATED METAL (for Coach Lamps)
BRITANNIA METAL
B. & M. BABBITT METAL for Bearings
LINING METAL for Automobile Bearings and Copper for Electrical Purposes
H. K. & F. S. BENSON
GLEN RIDGE, N. J.

THE SEYMOUR MFG. CO.
SEYMOUR, CONN.
German Silver
BRASS, COPPER and BRONZE IN SHEETS, WIRE, RODS and TUBES
COPPER AND NICKEL ANODES
Resistance Wires, Fuse Wire, Solder Wire, Shot Copper, Nickel Wire, Spark Plug Wire.

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99 John St., New York
MANUFACTURERS OF
BRASS and COPPER Sheets, Tubes, Rods and Wire
SOLE MANUFACTURERS TOBIN BRONZE
(Trade-Mark Registered)

THE PILLING BRASS CO.
WATERBURY, CONN.
Brass and German Silver
6 in. and narrower
.005 and thinner
PLATERS' METAL A SPECIALTY

THIS SPACE FOR SALE
Send for Rates

THIS SPACE FOR SALE
Send for Rates

Baltimore Copper Smelting and Rolling Company
BALTIMORE, MARYLAND
SHEET COPPER

"RIVERSIDE" German Silver Phosphor Bronze
Sheets, Rods, Wire, Ingots, Castings, Jewelers' Bars and Alloys
The Riverside Metal Co.
Riverside, Burlington Co., N. J.

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DELTA
REG. U. S. PAT. OFF.
THE PHOSPHOR BRONZE SMELTING CO., Limited.
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INGOTS, CASTINGS, WIRE, RODS, SHEETS, Etc.
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CASTINGS, STAMPINGS AND FORGINGS
ORIGINAL AND SOLE MAKERS IN THE U. S.

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134 ROBBINS ST.
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Manufacturers of
SEAMLESS Thin Gauges Small Sizes
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SPECIALTIES:
Irregular Shapes, Solid Drawn Work and Hydro-Carbon Lighting Tubing

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MANUFACTURERS OF
SEAMLESS.... NICKEL SILVER, BRASS, COPPER, BRONZE AND PURE COPPER **TUBING**
TUBING FOR ELECTRICAL PURPOSES
Odd and Special Shapes, and Small Tubing, a Specialty
—ALSO THE—
Bourdon Steam Gauge Springs
All sizes from 8 to 36, B. & S. Gauge.

The BUFFALO TUBE CO.
255 RANO STREET
BUFFALO, N. Y.
SMALL SIZES
Seamless Brass and Copper Tubing
PROMPT DELIVERY

UNITED WIRE & SUPPLY COMPANY
109 SUMMER STREET,
PROVIDENCE, R. I.
SEAMLESS BRASS and COPPER TUBING 1" O. D. and smaller in thin gauges. Lightning Rod Points and other tapered tubes.

PHENIX TUBE CO.
Manufacturers of
Brass and Bronze Iron Lined Tubes
For Metal Furniture, Car Rails, Curtain Rods, Etc.
Main Office and Mills: Brooklyn, N. Y. City Branch Offices: Chicago, San Francisco

SEAMLESS STEEL TUBING
From 3 in. Diameter to 1-64 in.
Finished Bright, Smooth and Accurate to 1-1000 in. Inside and Out
Tool Steel Tubing. Also Small Brass, Copper and Aluminum Tubing. Soft Steel Tubing.
ELLWOOD IVINS TUBE WORKS
Oak Lane Station, Philadelphia, Pa.

LINTON & CO.
95 PINE STREET PROVIDENCE, R. I.
MANUFACTURERS OF
SEAMLESS BRASS . . **TUBING**
In Small Sizes
GOLD SOLDER, sheet or wire.
SILVER SOLDER, sheet or wire.
SHEET BRASS SOLDER

WHITE METAL ROLLING MILL
Casting, Rolling and Refining for the Trade
BLOCK TIN, BRITANNIA and MUSIC PLATES
ROLLED AT A REASONABLE PRICE
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MANUFACTURERS OF
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SMALL SIZES THIN GAUGES
SPECIAL SHAPES
FOR ALL PURPOSES

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Rollers of Silver Anodes and Sterling Silver
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John Toothill
White Metal Rolling Mill
Casting, Rolling and Refining for the trade.
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ROCHELLE PARK, NEW JERSEY.

ROLLED FIRELESS STERLING SILVER
SILVER SOLDERS, ANODE SILVER and SILVER WIRE
For further information address
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91 Mechanic St. NEWARK, N. J.

THIS SPACE FOR SALE
Send for Rates

MANUFACTURERS OF PLATED SHEET METALS

Sheet Metals that save cost in manufacturing and do not rust

NICKELOID Nickel coated and polished Sheet Zinc.

COPPEROID Copper coated and polished Sheet Zinc.

NICKELED TIN

ZINCOID Zinc coated Sheet Iron.

Samples and information cheerfully furnished upon request

American Nickeloid & Mfg. Co., Peru, Illinois

National Sheet Metal Co.

MANUFACTURERS OF

Plated Sheet Metals

Nickelzinc, Brasszinc, Copperzinc, Bronzezinc, Nickeltin, Brasstin, Coppertin, Bronzetin

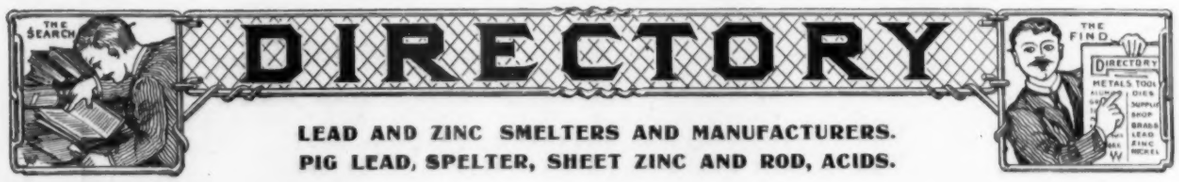
Sheet Zinc, polished and unpolished, for stamping

LARGE SAVING TO MANUFACTURERS

For further information address

Office - PERU, ILLINOIS

LAST YEAR'S SALES, 1,000,000 LBS.



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PIG LEAD, SPELTER, SHEET ZINC AND ROD, ACIDS.

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High-Grade Sulphuric Acid, Monohydrate and Fuming Acids of the Highest Concentration.

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Manufacturers of

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Telephone, 139 Beekman

High Grade Spelter

Suitable for High Grade Brass Work, Cartridge Metal, Etc.

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Sandoval Zinc Co.

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SUITABLE FOR ALL PURPOSES

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Works: Sandoval, Ills.

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Smelters of Spelter

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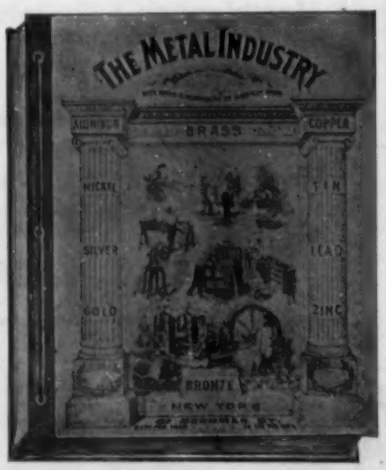

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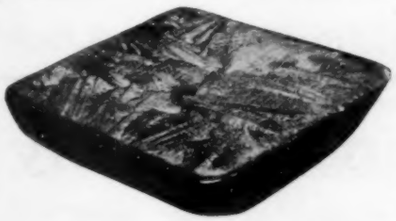

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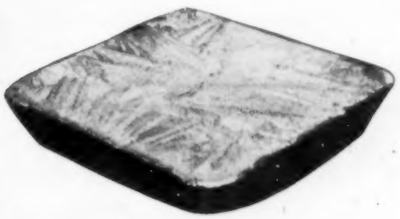

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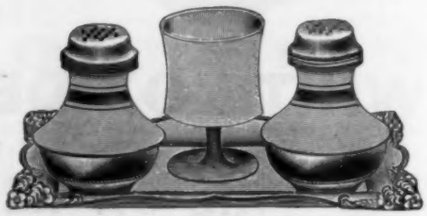

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PHILADELPHIA ARCADE BUILDING
BUFFALO 28 ERIE CO BANK BUILDING

We Can Save You Money on
SILVER-SOLDER
(FOR BRAZING, ETC.)
A tough, easy-flowing, *reliable* hard solder which we can furnish in any quantity or size at rock bottom prices. Quotations upon request
J. M. NEY & COMPANY
Hartford, Conn., U. S. A.
Alloys of Precious Metals for all Purposes

North American Smelting Company
PHILADELPHIA
Phosphor Bronze and Brass, Climax Bronze,
Manganese Bronze, Ingots and Castings,
Ingot Copper, Ingot Brass, Anti-Acid Bronze,
Babbitt, Type, Linotype and Stereotype Metals,
Tinners' and Brazing Solders,
Wire and Triangular Solders, Bar Tin,
Lead and Block Tin Pipe

TRADE LOVELL MARK TO USERS OF TRADE LOVELL MARK
WHITE METAL CASTINGS
Owing to a lighter demand at this season than usual for Portables and White Metal Novelties we can take on White Metal Casting Work to a limited extent in our foundry. This is an unusual chance to get high-grade castings at reasonable prices.
F. H. LOVELL & COMPANY
Arlington, N. J.

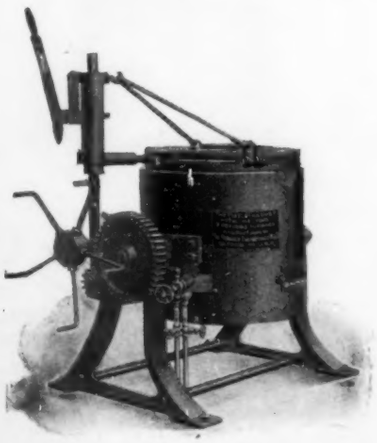
FOR INDEX OF ADVERTISEMENTS SEE PAGE 36

And the Anticipated "Taft" Murmur Was as a "Spring Zephyr"

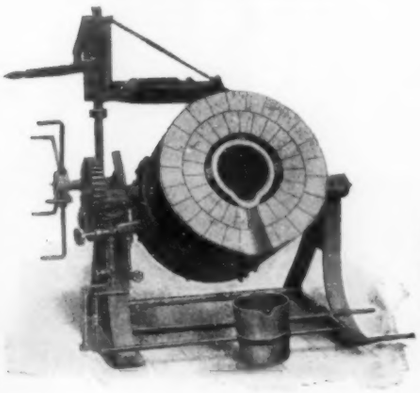
It resembled closely the period of transition, which occurs to those **reconstructed, rejuvenated "Brass Founders"** who have taken a course of medicine in **"Monarch Modern Methods."** Holy Gee! Ain't some of those old fossil guys callous? Skin so thick, eyesight so blind, purse so tight that a "Jersey Mosquito" would have no effect. **NOW,** that storm of "Prosperity" is approaching—"no bluff." We know it from the mass of letters received from our "Foundry" friends and our corps of salesmen on the road. The rank and file of America's foremost "Brass Founders" are as a solid unit in the demand for our

"Steele-Harvey" Crucible Tilting Melting Furnaces

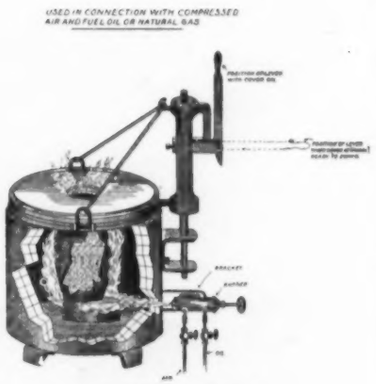
(Patented in all countries)



Melting Position.



Pouring Position.



Non-Tilting Furnace

Confidence in our saving of **50%** over "Coke or Coal" by using "Oil or Gas." Confidence in their dealings with the "Pioneer Originators and Conceptors" of "Crucible Furnaces." Remember! We build economically various varieties of **50** styles Crucible Furnaces, Single or Double, Portable or Stationary, Castings of ½ oz. to 1,500 lbs. Catering to Lock or Chandelier, Railroad, Hydraulic, Electrical class of requirements, or running down Scrap Metals, Dross and Skimmings. Capacities from No. 10 to 600 Crucible. "Orders subject approval." We furnish Burners for Molds, Core Ovens, etc., Ladle Heaters, Pumps, Blowers, Fans, Tanks, and full "Brass Foundry Equipment."

Prices Low. Shipments Quick. Dealings Square. Settlements Agreeable.

"Our chain of references endless, based upon 17 years' experience."

WRITE FOR CATALOG "M I" 3—1908 SERIES

THE MONARCH ENGINEERING AND MANUFACTURING CO.

1200-1206 American Building

Shops, Curtis Bay, Md. **BALTIMORE, MD., U. S. A.**

Representatives in all leading cities and sections of this country and abroad.

Brass Foundry Supplies

FORCED and NATURAL DRAFT FURNACES and MAGNETIC SEPARATORS, etc., etc.

Furnaces for every purpose

Catalogues ? Sure !

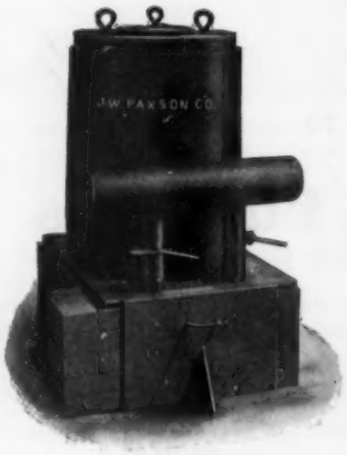


Fig. 621
Forced Draft Furnace

Fig. 622
Natural Draft Furnace
"SQUARE"

Fig 623
Natural Draft Furnace
"ROUND"
Also made with drop-grate, and with closed bottom to be used with forced draft

Fig. 209
Sprue Cutters. All Sizes

OUR
New Bulletin No. 18
TELLS ALL ABOUT
Molding Sand
Core Sand
Fluxing and
Partings
For Brass Foundries

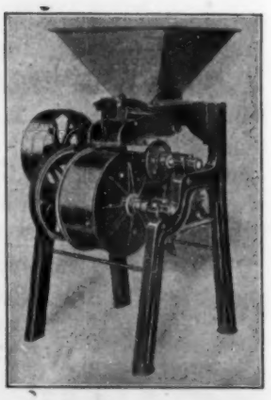


Fig. 76
The Paxson-Sawyer Magnetic Separator

J. W. PAXSON CO., PHILADELPHIA

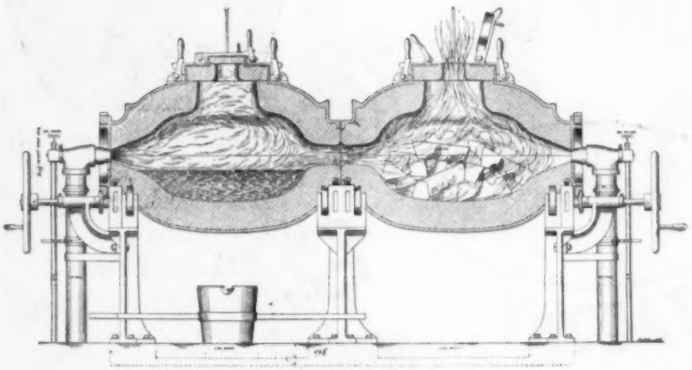
MELTING FURNACES

MANUFACTURED BY

ROCKWELL FURNACE COMPANY

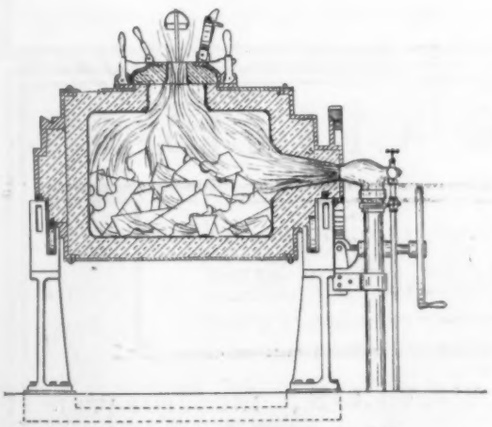
26 CORTLANDT STREET, NEW YORK

WE MEET ALL CONDITIONS



DOUBLE CHAMBER—OIL OR GAS.

We do not confine ourselves to any **one method** of melting metal, but give our customers an opportunity to select the type best adapted to their requirements, and **guarantee results.**



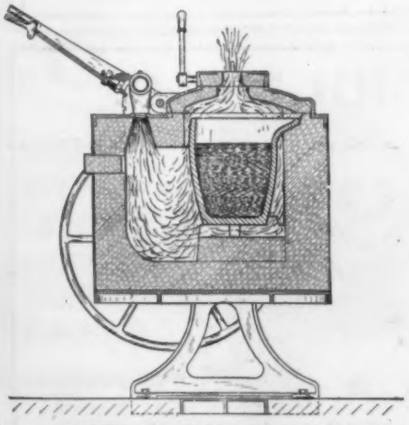
SIMPLEX OPEN FLAME—OIL OR GAS.

Our new 32 page catalog of melting furnaces shows **21** different types of furnaces backed by an experience in the melting field equalled by no other concern.

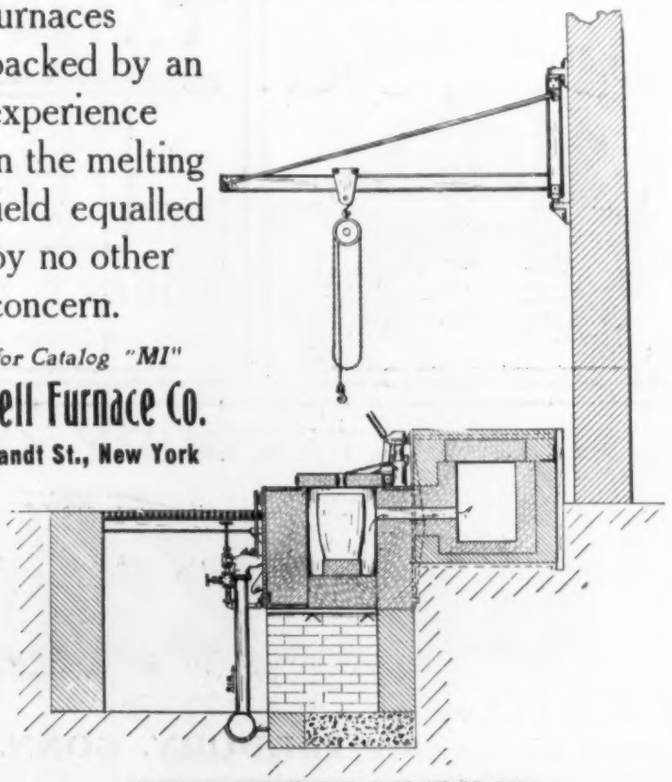
Write for Catalog "MI"

Rockwell Furnace Co.

26 Cortlandt St., New York



CRUCIBLE TILTING—OIL OR GAS.



CRUCIBLE—COMBINATION—COAL OIL OR GAS.

The Brand of Quality

ROSS-TACONY CRUCIBLE CO.
(Size Number)
TACONY
PHILADELPHIA, PA.

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27 William St.

Chicago Office
36 La Salle St.

ROBERT J. TAYLOR INCORPORATED.

TAYLOR CRUCIBLES

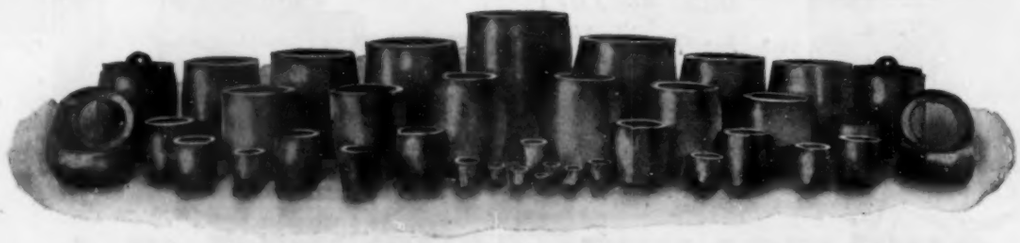
For Years the Recognized Standard for Uniform Service

IF INTERESTED WRITE US

ROBERT J. TAYLOR, INCORPORATED

1900 to 1916 Callowhill Street *PHILADELPHIA, PA.*

THE WATERBURY CRUCIBLE CO.



WATERBURY, CONN., U. S. A.

London Office - - - - - - - - 28 Victoria Street

With a New President for Our Country, YOU want a Grand New Crucible for . . . .

Your Business Success of 1909

PAIGE'S POTS

will help you succeed

Taunton, Mass.

Dixon Crucibles

The Kind That Last

When proper care accompanies the use of Dixon's Crucibles they will be always found to give the very best of service. If you do not know just how good these crucibles are, you should try them at once.

Write for new, handsome crucible booklet 12-A.

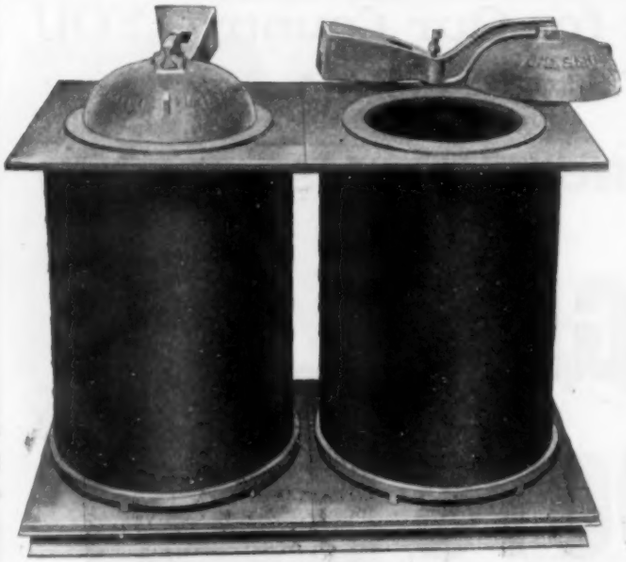
JOSEPH DIXON CRUCIBLE COMPANY
JERSEY CITY N. J., U. S. A.

TAUNTON CRUCIBLE COMPANY

Blacklead CRUCIBLES and RETORTS
TAUNTON, MASS.
Established 1865

UNIFORM - - - EFFICIENT

Send for List of Sizes and Prices



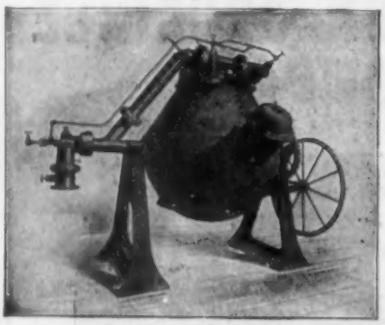
Brass Furnaces

EQUAL
DRAUGHT
ON ALL
FURNACES IN
SAME SETTING

The Cover That Swings

Steel Work
Floor Gratings
PLANS FOR :: Complete Settings

THE J. D. Smith Foundry Supply Co.
FOUNDRY ENGINEERS
Cleveland, O.



6 Sizes, 100 to 20,000 lbs. per heat. Fuel: oil or gas

ECONOMY ALL AROUND—IN FUEL, MELTING SPACE, LABOR.

BRASS, BRONZE, COPPER, ALUMINUM,
MALLEABLE IRON, GREY IRON, STEEL

ALL LINES LEAD TO
HAWLEY (Schwartz) SYSTEM
ASK US WHY

Air Furnace : Bessemer Converter : Open Hearth Furnace
Crucible Furnace : Side Blow Converter : Reverberatory Furnace
Special Furnaces constructed to meet all metallurgical conditions. Send for New Catalog containing valuable data on Metallurgy

HAWLEY DOWN DRAFT FURNACE CO.
CHICAGO and NEW YORK

Established 1866.

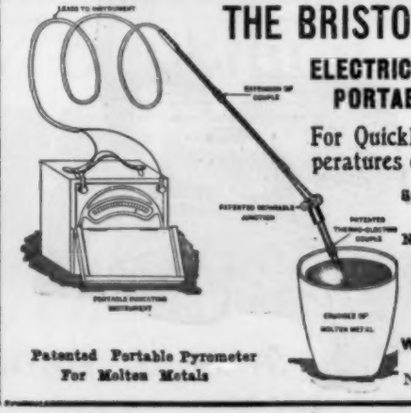
Crucibles.

All sizes and for all purposes.

No. 0 to No. 400.

R. B. SEIDEL, Inc.

Philadelphia Black Lead Crucible Works,
1322-34 Callowhill Street, PHILADELPHIA



Patented Portable Pyrometer For Molten Metals

THE BRISTOL COMPANY

ELECTRIC PYROMETERS
PORTABLE OUTFITS

For Quickly Taking Temperatures of Molten Metal

Switchboard and Recording Models

New Recording Shunt Ammeters

THE BRISTOL COMPANY
WATERBURY, CONN.
Branches at New York & Chicago

The Largest Foundry Supply House In The World

Separate the Iron and Dross from the Brass

BY USING

"ESSO" Patent Flux

Melters of copper, brass, bronze, German silver, aluminum and alloys will find it a great help in melting, as the time is lessened considerably. It increases the fluidity of the metal, removes the oxide, and cleanses the metal from dross and impurities. It eliminates the gases, makes the product free from the usual porosity, and increases the electrical conductivity. In melting emery dust, buffings or burnt skimmings, results are very satisfactory, the product being clean and the slag free from metal.

Remember—We manufacture "Everything you need in your brass foundry"
Ask for Catalog 2-x

EVERYTHING YOU NEED IN YOUR FOUNDRY

The S. Obermayer Co.

CINCINNATI CHICAGO PITTSBURG

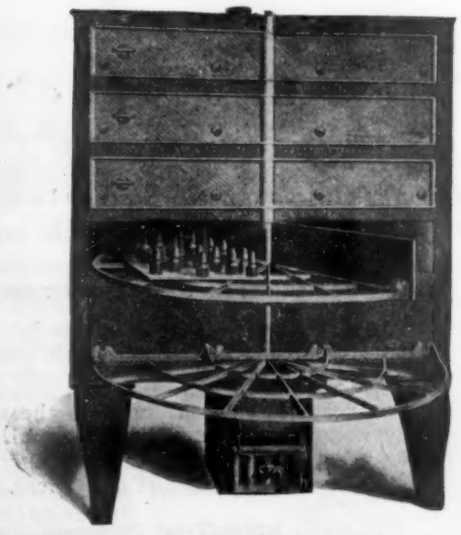
Canadian Agents: The Dominion Foundry Supply Co., Toronto and Montreal

We Have Been Manufacturing Since 1874

THE LATEST AND BEST

Improved Portable Core Oven

PATENTED



More Shelf Room. No Escape of Heat in Loading or Unloading.
Economical in Fuel. Practical in All Respects.

Send for further particulars

SOLE MANUFACTURERS

THE HILL & GRIFFITH CO., Cincinnati, Ohio, U. S. A.

Also Manufacturers of Graphite, Plumbago, Foundry Supplies and Equipments.

YOU can dip this into a pot of brass 500 times and read the exact temperature on a

HOSKINS HEAT GAGE.

PRICE $50.

STRONG
ACCURATE
and
PORTABLE

Can you afford to guess?

We think not, because your zinc loss from overheated metal is many times the cost of our Heat Gage.
Send for Catalogue and list of users.

The Hoskins Company

93 ERIE STREET, CHICAGO, ILL.

FOR PERFECT PARTINGS
ACCEPT NO OTHER
SEE TRADE MARK

Suitable for Bronze, Brass or Any Other Metal

FAR SUPERIOR TO
Lycopodium—Charcoal—Charcoal Facings

FOR Straight and Difficult Lifts — Sticky Patterns, Slanting Copes and Deep Chasings

PERFECT PARTINGS
MEAN
Sharper Castings — Smoother Surfaces
Perfect Corners — Easier Lifts

DOGGETT'S PARTING
PERMITS
Swabbing and Slicking—Will not burn off the face of the mould, wash or cut.

Manufactured by
Stanley Doggett, 101 BEEKMAN STREET NEW YORK CITY, U. S. A.

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The J. S. McCormick Co., Pittsburg, Pa.
Detroit Foundry Supply Co., Detroit, Michigan.
Western Foundry Supply Co., East St. Louis, Ill.
N. Y. Sand & Facing Co., Brooklyn, N. Y.
Francis H. Hyde & Co., 31 Wellington Street, Montreal, Canada.
Frank E. Sutch, Harrison Bldg., Philadelphia, Pa.

Working Samples Sent Free Upon Request

BASSITE

An alloy designed to take the place of TIN in the manufacture of Brass Castings

IT SAVES
THE BRASS FOUNDER

fully 33⅓% of the usual outlay for Tin and 10 to 30% upon the cost of finishing castings

Sample castings made with Bassite will be forwarded to anyone interested, and 100 lbs. will be sent for trial with no obligation to pay unless our claims are substantiated

THIS IS WORTH INVESTIGATING

BASSITE MINING & SMELTING CO.
Commercial Tribune Bldg. Cincinnati, O., U. S. A.

"FLUXINE" is the only brass flux that will make a new, pure and clean metal out of the old waste, scrap, turnings, borings and grindings, without injury to the metal or crucible.

Fluxine

Removes the iron from the brass and copper.

Prevents oxidation, thereby reducing the percentage of loss in melting.

Reduces the oxides to their metallic state.

Produces a more homogeneous alloy and causing a greater fluidity in the metal which prevents blow holes.

Imparts a greater tensile strength to the metal. Positively removes all impurities in metal. We guarantee to save you from five to six per cent in melting. Write for pamphlet and prices.

Put up in 50 lb. Trial Packages.

Manufactured only by

THE FOUNDRY SPECIALTY COMPANY
CINCINNATI, OHIO, U. S. A.

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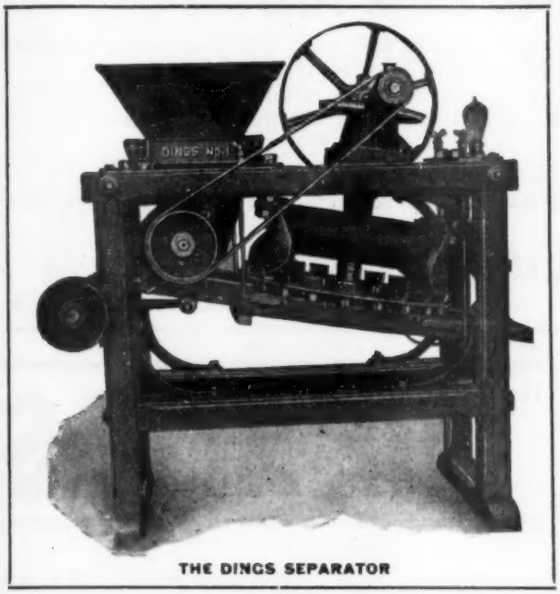


THE DINGS SEPARATOR

DIFFERENT KINDS AND SIZES MADE
TO SUIT ANY REQUIREMENTS

DINGS ELECTRO-MAGNETIC SEPARATOR CO. MILWAUKEE, WIS.

NOBLE'S ELECTRO-MAGNETIC METAL SEPARATOR

MOST PRACTICAL, EFFICIENT AND ECONOMICAL

For BRASS FOUNDERS and all other purposes requiring the separation from Magnetic Metals.

Orders solicited subject to approval after 30 days' trial.

WRITE FOR CATALOGUE M AND PRICES.

CAPITOL BRASS WORKS, - Detroit, Mich.

LEIMAN'S NEW FOUNDRY

SAND BLAST $45

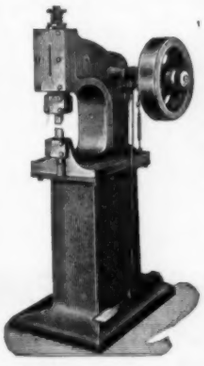
Complete
Guaranteed for all Light or Heavy Work

OTHER SAND BLASTS $15 & UP

PRESSURE BLOWERS $17 & UP

For Sand Blasting, Gas Appliances, etc.

LEIMAN BROS. 70 Benyhamper Ave. NEWARK, N. J.
62 John Street NEW YORK **MANUFACTURERS**



YOU MUST TRIM
THE SPRUES FROM
YOUR CASTINGS

What you need is a SHUSTER FOOT LEVER or POWER SPRUE CUTTER. Soon pays for itself in time and labor.

They do the work quick and easy, making the cuts so clean and close that castings trimmed in this way seldom need grinding.

You can't afford to be without one. Lasts a lifetime.

Do you ever have occasion to use wire, straightened and cut into certain lengths? Or have any riveting to do?

For description and prices write

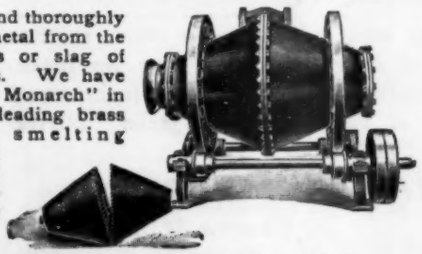
THE F. B. SHUSTER CO.

Formerly JOHN ADT & SON,

NEW HAVEN, CONN.

MONARCH CRUSHER AND PULVERIZER

Absolutely and thoroughly reclaims the metal from the ashes, cinders or slag of brass furnaces. We have installed "The Monarch" in some of the leading brass foundries and smelting works, and all users advise that this machine is giving satisfaction.



O. J. MOUSSETTE CO., Inc.
Tools, Dies, Presses and Special Machinery
Driggs Ave., cor. North 10th Street, BROOKLYN, N. Y.

"Bliss" Four-Poppet Drop Press.

"BLISS"

"PRESSES FOR EVERY PURPOSE"

We show one of our large line of plain and Belt Lift Hammers, weighing from 40 lbs. to 1,700 lbs. Total weights, 400 lbs. to 17,000 lbs.

"Bliss" presses for every requirement of sheet metal working are equipped with every convenience for rapid production. They are the most efficient and the most economical.

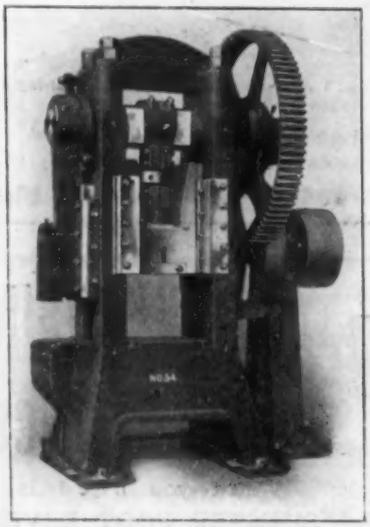
REMEMBER

Whatever your press requirements may be there is a "Bliss" to meet them profitably.

E. W. BLISS COMPANY

23 ADAMS STREET **BROOKLYN, N. Y.**

BLANKING, Drawing, Shearing, Axe, Pickeye, etc., Presses, Cornice Brakes, Shears, Rolling Mill Machinery and any heavy machinery on specifications, and particularly Chilled Rolls turned, ground and polished.



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Established 1803

"THE ATLAS"

No. 1 Bench Power Press
A HANDY MACHINE FOR MANUFACTURING. DELIVERY FROM STOCK.

Power, Foot and Drop Presses, Spinning, Edging, and Turning Lathes, Clock or Manufacturing Drills.

Slitters, Flattening and Straightening Rolls. Tube, Rod and Wire Draw Benches.

Special Machines Built on Contract to your Drawings.

Send for Catalogue M.

THE ATLAS MACHINE CO.

31 CANAL STREET **WATERBURY, CONN.**

HYDRAULIC JACKS

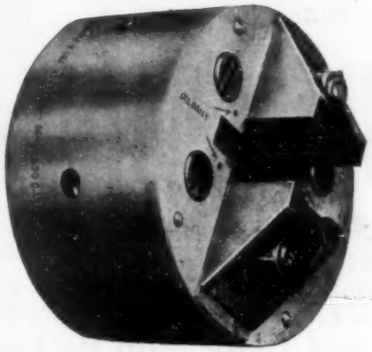
If this particular style is not what you have in mind, remember, this is only one of over 250 styles that we make. Jacks for every jack need—whether you work in cramped quarters or have lots of room—"W-S" Jacks "fill the bill" best. Suppose you write for the "Jack Book."

WATSON-STILLMAN COMPANY

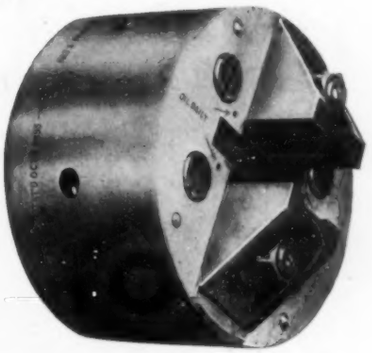
Chicago Office, 453 The Rookery *50 Church St., N. Y. City*

FOR INDEX TO ADVERTISEMENTS SEE PAGE 36

THE MANUFACTURING CHUCK



Strongly Endorsed by Prominent Users



Eddy Valve Company.

Waterford, N. Y. Sept. 10th, 1908.

W. L. Abate, Esq.,
76 Lincoln Ave.,
Mount Vernon, N.Y.

Dear Sir:-

In reply to your letter asking what satisfaction the Chuck of your manufacture which we have in use has given, would say that we have found it to be a most serviceable device, as it works rapidly and accurately. We would not care to be without it.

Yours very truly,
EDDY VALVE CO.

J. B. Colt Co

Makers of Acetylene Gas Apparatus Stereopticons and Scissors

Factory 9 to 15 Desbrosses Street
New York June 12th 1908.

Mr. T. F. Kane,
418 East 57th St.,
New York.

Dear Sir:-

In reply to your letter of recent date for an expression regarding your improved automatic turret Blue chuck, would say it gives entire satisfaction. Our men are now enabled to turn out from 8C to 100% more work than they did formerly with the ordinary two jaw chuck.

You may send us three pair of small cast iron jaws.

Very truly yours,
J. B. COLT CO.
E. Unger Supt.

Neptune Meter Co.

Trident Water Meters

Long Island City, N. Y.

Mr. Wm. L. Abate,
776 Lincoln Avenue,
Mount Vernon, N. Y.

Dear Sir:-

In reply to your letter of Sept. 2nd, 08, as to the merits of the Krug or Manufacturing Chuck, would state that we have used six of them continuously for the past five years and we recommend them highly on all classes of small brass fittings.

Yours very truly,
Neptune Meter Co.
By J. Pantin Supt.

247--27/11th

E. Stebbins Mfg Co

Manufacturers of Plumbers Brass Goods

Springfield, Mass. Aug. 10, 1908

W. L. Abat, Esq.,
418 East 136th St.,
New York City.

Dear Sir:-

We beg to state that we have been trying out the Manufacturers Chuck which you sent us as sample and we have to say that we are very much pleased with same and if the chuck proves to meet our call, we believe it is the best thing of its kind that we have ever seen. We are sending you herewith an order for six.

We should be very pleased to have you refer any prospective customers to us.

Yours very truly,
A. H. Stebbins Treasurer.

AHS/HCP

Westinghouse Electric & Manufacturing Company

Pittsburg, Pa.

NEWARK WORKS

NEWARK, N. J. Sept. 5, 1908.

Mr. W. L. Abate,
776 Lincoln Ave.,
Mount Vernon, N. Y.

Dear Sir:-

Replying to your favor of Sept. 2nd, we beg to advise that we are not in the market at the present time for any additional manufacturing chucks. We consider the same a very useful contrivance and shall not hesitate to interview the worker which we are now working with, whenever we are in need of same.

Yours very truly,
E. Traxler
Superintendent Newark Works.

EPE/L.

EDW. SCHROEDER LAMP WORKS,

RAILROAD AND HOTEL LANTERNS,

CAR LAMPS A SPECIALTY.

JERSEY CITY, N. J., Sept. 11th, 08.

Mr. W. L. Abate,
76 Lincoln Avenue,
Mount Vernon, N. Y.

Dear Sir:-

Referring to your letter of the 2nd inst. The chuck which we bought in 1908 of Mr. Krug has given satisfaction. It may be that when business picks up again we shall be in the market for another one of those chucks and suggest that when you are next in this vicinity you call in and explain to us just what improvements have been made and give us a quotation on one of the improved chucks.

Yours truly,
M. Schroeder
Manager.

MS.

W. L. ABATE, 76 West Lincoln Avenue

MT. VERNON, N. Y.

FARREL FOUNDRY & MACHINE CO.

ANSONIA, CONN.

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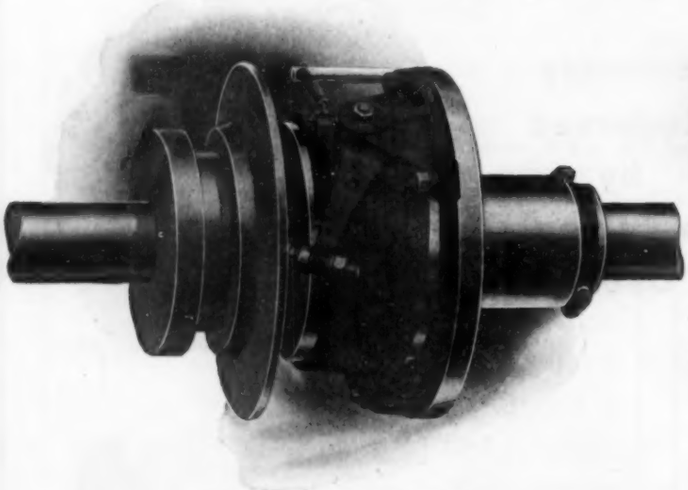

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For rolling strips of iron, steel, brass, copper, etc.

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are reliable and can be operated by men of ordinary intelligence.

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This man without special instructions but with the use of "horse sense" causes his plant to work fine. There is a volume of praise for "OTTO" machinery in Mr. Witter's short letter.

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No Stopping Work—No Time Lost

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SIZE: Octavo. PAGES: 1,228. CHAPTERS: 25. SCOPE: The Copper Industry of the World.
COVERING: Copper History, Geology, Geography, Chemistry, Mineralogy, Mining, Milling, Leaching, Smelting, Refining, Brands, Grades, Impurities, Alloys, Uses, Substitutes, Terminology, Deposits by Districts, States, Countries and Continents, Mines in Detail, Statistics of Production, Consumption, Imports, Exports, Finances, Dividends, etc.
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THE MINER needs the book for the facts is gives him regarding Geology, Mining, Copper Deposits and Copper Mines.
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Annealing Without Oxidation by Automatic Machines

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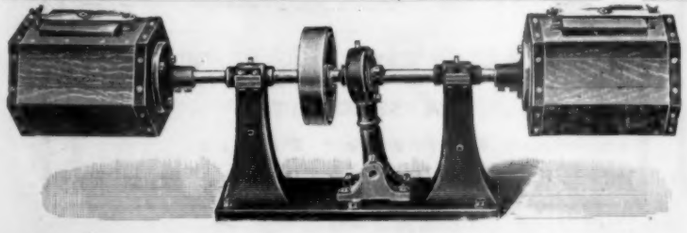

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Polishing and Burnishing without Hand Labor
Saves Time and Money for Manufacturers of Brass Foundry, Jewelry, Etc.

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Here's the polishing lathe for comfort. Belts from below, no belts in the room to cut off light or create drafts, and no danger to operator. Starts or stops in 5 sec.

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No strain on the belt except when machine is in use. Hangs loose when machine is idle. An average relacing once in two years.

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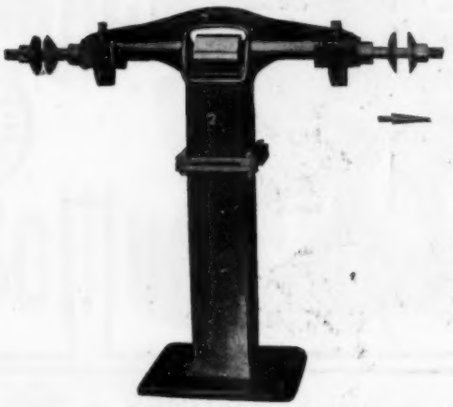

THIS lathe, manufactured by us, is the result of years of experience in the manufacture and sale of buffing and polishing machines. Furnished with crucible steel shafts, dust proof bearings, cast iron boxes.

We are manufacturers and dealers in plating and polishing supplies, and solicit an opportunity to submit quotations.

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FOR TWELVE YEARS

we have been manufacturing a high-grade Acid-Proof Vitrified Non-Absorbent Brick suitable for Acid Tanks, Plating Room flooring, etc., etc.

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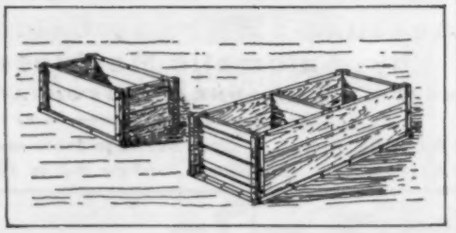

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NEW DISC SURFACE POLISHER

Designed to polish any flat surface from the rough to a buff finish. Any kind of metal or wood can be ground or polished on this machine.

For FITTINGS, VALVES, SURFACING CASTINGS, FORGINGS, PLATES, TYPEWRITER PARTS, TELEPHONE PARTS, STOVE CASTINGS and all work where a true and polished surface is required.

For the MACHINE SHOP and TOOL ROOM it will do the work in less time and with less cost for labor than any other tool. The cutting discs are sized with Carborundum or Adamite of suitable grain to give the desired finish. These discs are cemented to a steel plate, which is interchangeable. A coarse disc for roughing or cutting down may be cemented to one side of the plate and a finer disc for finishing cemented to the opposite side of the plate.

These machines are built in two sizes, a press for cementing the cutting discs to the steel plate and a patent countershaft are furnished with each machine.

No. 2 with 20 in. disc. Any work up to 16 ins. long by 8 ins. wide can be polished on this machine.

No. 3 with 26 in. disc. Any work up to 21 ins. long by 10 ins. wide can be polished on No. 3 machine.

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Everything for Electro Plating, Polishing and Buffing

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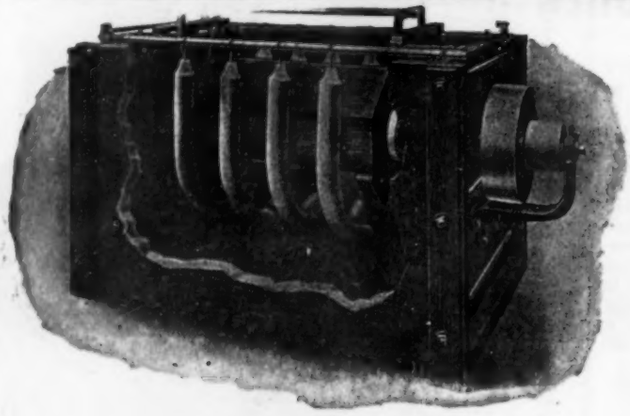

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Patented June 22, 1897, Feb. 24, 1903, Oct. 11, 1904. Other patents pending.

The most efficient plating apparatus in the market. Over 500 in use by the trade.

We will finish sample lots of work without charge.

This apparatus is a proved money saver where small work is to be plated. Can be used in Nickel, Copper, Brass, Zinc and Silver Solutions.

No Stringing. No Wire Used. No Metal Plating Trays or Baskets. No Unstringing. No Loss of Metal.

Capacity: 50 lbs. to 500 lbs., according to size.

Basket can be removed at will—without interfering with drive. In larger sizes basket is raised and lowered automatically.

Useful for plating: Bolts, Nuts, Rivets, Screws, Buckles, Ferrules, Typewriter and Sewing Machine Parts, Lamp Fixtures, Saddlery and Trunk Hardware, Carriage Trimmings, Screw Tops, Shells, Stove Fittings, Locks, Keys and small work.

Apparatus is Used for Electro-Galvanizing Small Articles

We Can Furnish a List of Over 200 Users of this Apparatus. Many of the Larger Firms Are Using 10 or more

WRITE FOR BULLETIN No. 113

The HANSON & VAN WINKLE COMPANY

Manufacturers of Dynamos from 50 to 5,000 Ampere Capacity, and all Supplies for Electro-deposition.

(WRITE FOR BULLETINS 105 and 112)

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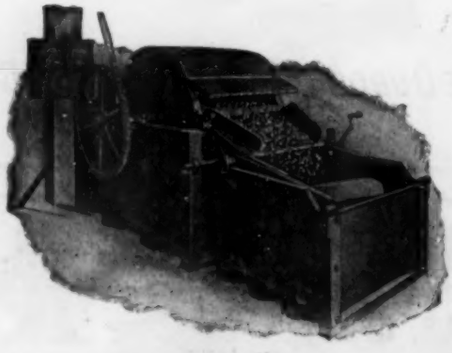
Patent Electro Galvanizing at Half the Cost and Far Better.



We have a number of newly patented devices, which handle almost 90 per cent. of material automatically. One of them is our patent automatic galvanizing barrel shown herewith. Advantages: Exceptional low cost of galvanizing. Coating smooth, bright and perfect, not depending on operator. Capacity 2,000 to 3,000 lbs. per day. PLANTS furnished for treatment of any kind of material. JOBBING work done at our factories and branches. Apply for prices, particulars, etc., at the most conveniently located address given below.

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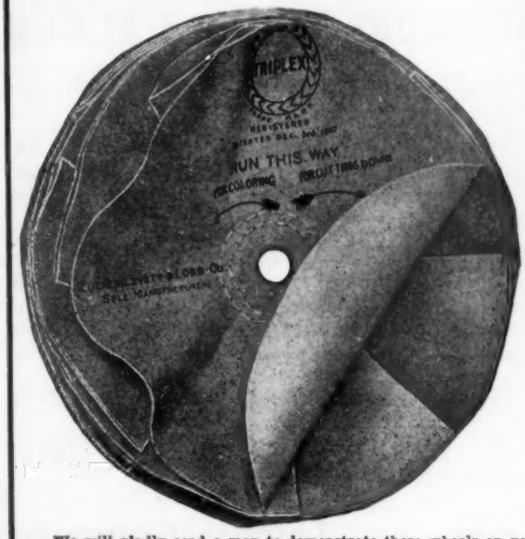
THE TRIPLEX BUFF

A New Buff that is rapidly supplanting all other kinds. The letters printed below prove that old style Buffs are now obsolete

In 1907 this Buff was patented; since then its success has been almost phenomenal. The secret of its great wearing qualities is in the FOLD. Its economy is due to the fact that EVERY STRAND OF MUSLIN is used up in doing actual work. When the wheels are worn down the stubs may be returned to us and made into new wheels at nominal cost, using two old wheels to make one new wheel of approximately double the diameter of the old. Read what a few of our customers say:



Victor Talking Machine Co., Camden, N. J.

With one [Triplex] wheel we buffed four hundred pieces of our part 714A and three hundred pieces of our part 705A, while with one of our regular buffs we can do only two hundred pieces of our part 714A and two hundred and fifty pieces of 705A, both buffs using about the same amount of Tripoli, but the Triplex buff is much cleaner. Therefore, according to this report, the Triplex buff does more than again as much work as an ordinary buff.

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We have been using buffs made under the Painter Patent since June 18th last, and notwithstanding our increased business this year, our saving in buffs alone has been about $500, and we feel safe in saying that these savings will exceed at the rate of $100 per month for the year 1907. Our foreman's account shows that one wheel made of eight sections, eighteen ply each, under the Painter system, **has done as much work as three wheels of same dimensions and quality made of loose buffs.** In Tripoli composition we find a saving of about 20 per cent.

In addition to the above, our men are doing more work, better work, and they claim with an expenditure of less labor and physical force.

The Bryant Electric Co., Bridgeport, Conn.

We consider them to be the best buff we have ever used at any price, and we expect to use them practically exclusively when our stock of the old type is exhausted.

John L. Gaumer, Philadelphia, Pa.

Economy, therefore, will dictate that your Patent Buffs will take the place of the old methods.

Send for Description of our New Two-Bar Silverlite Nickel Anode

IMPORTANT NOTICE

Any folded buff not stamped with our trade mark "TRIPLEX," used or sold is an infringement on our license patent and our rights in this respect will be strictly enforced.

We will gladly send a man to demonstrate these wheels on your own work. Send in your orders NOW—they will be filled in regular order at current prices. Send for descriptive bulletin TB.

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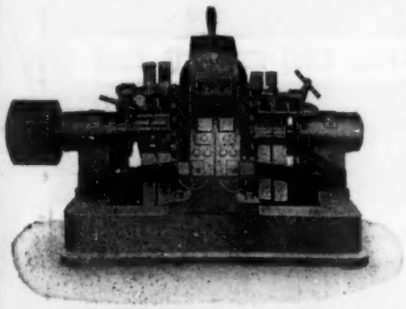

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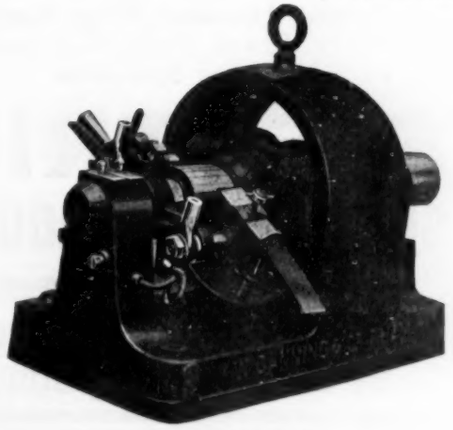

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Our Tripoli Flour is used by all manufacturers of Buffing Compositions, Metal Polishes, Polishing Rouges, etc., etc., and by many of the manufacturers of Mechanics Soaps, Scouring Soaps, Cleaners, etc.

We shall be glad to quote prices upon application.

TRIPOLI FLOUR MAY BE JUST WHAT YOU WANT.

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(Also Tripoli Stones for Water-filters)

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is adapted for cleaning all metals before plating

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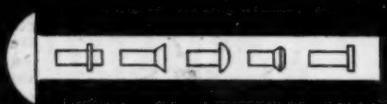
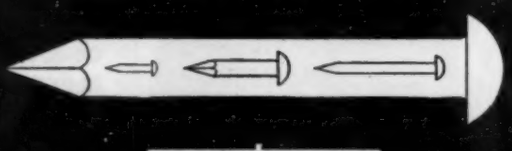


ESCUTCHEON PINS



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"All work of quality must bear a price in proportion to the skill, time, expense and risk attending the invention and manufacture. Those things called dear are, when justly estimated, the cheapest."

Our Lacquers are always of a good reliable quality and will prove more economical than the so-called cheap kinds.

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are the outgrowth of many successful experiments continued through years, whose results have been proved and tested at our expense. You save the cost of experiments when you buy Barrett's.

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70%

of Our Customers Have Ordered Extra Machines of Us

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(Metal Bedsteads & Spring Beds)

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Gentlemen:—Replying to your letter of the 28th, would say that we are using two of your spraying machines, one of the quart capacity, the other a pint, with very satisfactory results. They do not clog up and the repairs so far have been nothing. We consider your sprayer, for work where it is adapted, the best machine we have had.

Yours truly, FOSTER BROS. MFG. CO.

It will pay you to apply your Lacquer, Japan, Paints, etc., by our Process. Write for information.

EUREKA PNEUMATIC SPRAY CO., 400 CANAL ST. NEW YORK

THE METAL FINISH

The Electro deposition on your metal is all right, but the Lacquer protecting it isn't unless it's pure and unadultered

Avoid risk—use Egyptian.

Write for descriptive circulars.

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152 Front Street, :: New York City

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"New Era" Lacquers HAVE QUALITY

We Buy Quality, Talk Quality, GIVE QUALITY

"Quality is the underlying principle of the most successful businesses."

The manufacturer who calls your attention to the low price of his product has little else to talk about. While we try to keep within the bounds of Low Prices, we do not make a specialty of it.

We can satisfy anyone who is wise enough to see the value of the BEST regardless of the shade difference in the cost.

THE NEW ERA LUSTRE CO.

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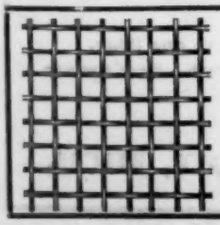

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BUFFALO WIRE WORKS CO.

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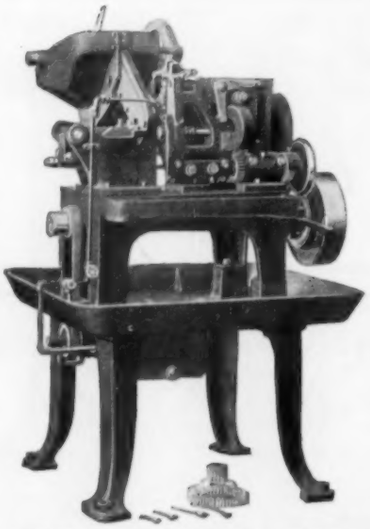
SCREW-MAKING MACHINERY



AUTOMATIC SCREW SLOTTING MACHINE

The illustration opposite shows an improved Automatic Slotting Machine for cutting slots across the heads of screw blanks such as fillister head screws, stove bolts and other work of a similar nature.

Our experiments and study preliminary to the designing of this machine were directed toward obtaining accurate work at a rapid rate of production and especial attention was paid to the **rigidity** and output of the slotter. We solicit inquiries regarding this machine as well as descriptions or samples of the work to be done on it.

SCREW THREAD ROLLERS.

AUTOMATIC

SCREW BLANK HEADERS.

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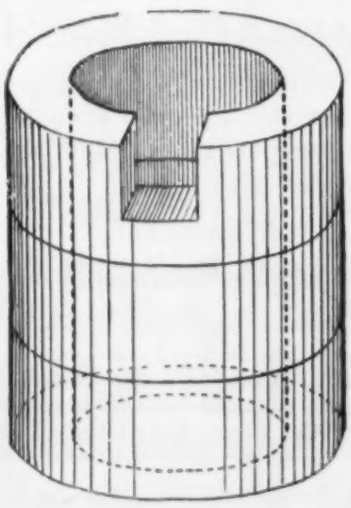
WATERBURY, CONN., U. S. A.

We also build Automatic Rivet and Nut Machinery, Thread Rolling Machines, Drop Presses, Automatic Drop Hammers for Forging, Chain Draw Benches, Hydraulic Machinery, Pumps, Accumulators, Power Presses, Rolling Mills, Shears, Slitters, Finishing Machinery for Sheet Brass, German Silver, etc.



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The toughest, most refractory, most durable and most economical block on the market; outwears every other lining. Made to fit any brass furnace, and all sizes in stock.

Made of same material as Stevens' Cupola Blocks, which fit any cupola, and give long life, thereby reducing your cost.

Just the thing for your Brass Foundry.

Now! for your Plating Department.

One of the expenses of the buffing room is the cost of Spanish Felt Wheels. You may renew the life of these wheels after they have become hard from long service with the use of STEVENS' POLISHERS' FRIEND.

It is put up in paste form in paper cartons. It costs less than tallow, besides this composition has cutting qualities as well as producing the softening effect upon the wheel.

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I make Foundry Facing and Supplies, Buffing Compositions and Platers' Supplies, Spanish Felt Wheels, Fire Brick, Flat Fire Tile, Cupola Blocks, etc., etc.

My men sell anything you want for a successful foundry. They go up against those who sell only one thing.

It takes a smaller slice of profit to sell you all the goods; I take the small slice, you take the rest. Here's where you win. That's the way you profit when you deal with STEVENS.

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